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HIRATA (S.). **On the rust fungi of Cowpea, Kidney Bean and small red Bean.**—*Ann. phytopath. Soc. Japan*, 16, 1, pp. 13–18, 3 figs., 1952. [Japanese. Received March, 1953.]

From a study of the rusts attacking cowpea (*Vigna sinensis*) [*V. unguiculata*], kidney bean (*Phaseolus vulgaris*), and small red bean (*P. angularis*) in Japan [cf. *R.A.M.*, 31, p. 72] the author differentiates *Uromyces azukicola* as a new species with the following characters. The brown, obovoid or subellipsoid uredospores measure 14 to 26 by 18 to 34 μ and have an echinulate to verrucose epispore about 1 μ thick. The chestnut-brown, ellipsoid, angulate-ellipsoid, or irregular teleutospores measure 10 to 32 by 20 to 39 μ with a subhyaline papilla at the apex, an epispore 1·5 to 2 μ thick, and a hyaline pedicel up to 15 μ long. It occurs on *P. angularis*, *P. pendulus*, and *P. trilobatus*.

VIENNOT-BOURGIN (G.). **Sur la présence en France de Botrytis squamosa, parasite de l'Oignon.** [On the presence in France of *Botrytis squamosa*, a parasite of the Onion.]—*Rev. Path. vég.*, 31, 2, pp. 82–98, 4 figs., 1952.

During the winter of 1951–2 Barletta onions growing near Rennes, Brittany, developed a wilt of the leaf tips caused by *Botrytis squamosa* [cf. C.M.I. map No. 164; *R.A.M.*, 23, p. 161; 30, p. 301], not previously recorded in France. In nature the formation of the conidiophores and conidia takes place only in a saturated atmosphere and mostly between 8° and 16° C. [ibid., 6, p. 267]. At temperatures above 22° and at about 0° conidial formation ceases. The fungus is actively parasitic in France only at the end of summer and in autumn, hot or stormy periods arresting conidial formation. In the field sclerotia were not found on dead leaves, though lamellar sclerotic masses, differing in appearance from typical sclerotia of *B. squamosa*, were seen in the decomposed tissues of onion leaves in contact with the soil. In culture sclerotia develop abundantly, formation being particularly rapid (three days) on Czapek's medium.

Experimental evidence demonstrated that after exposure of tube cultures for 48 hours to temperatures ranging from 0° to —10° the fungus remained viable. Sporulation ceased at temperatures ranging from —4° to —10°, while at —8° to —10° complete loss of parasitic ability resulted. Series maintained at 0° to —4° retained their parasitic and reproductive faculties.

The prevalence of the fungus in Brittany during the winter of 1951–2 was probably related to the exceptional mildness of the weather at this period.

LARSON (R. H.) & WALKER (J. C.). **Arasan for smut control in set-Onion plantings.** —Abs. in *Phytopathology*, 42, 9, p. 469, 1952.

Over the five-year period from 1947 to 1951, inclusive, an average of 77 per cent. of sett onions grown from untreated seeds in commercial fields on the upland soils of

south-eastern Wisconsin were infected by smut (*Urocystis cepulae*) [*R.A.M.*, 32, p. 352]. The standard formaldehyde drip treatment [ibid., 27, p. 404] reduced the percentage of diseased plants to 6·4 and arasan [containing thiram] at $\frac{1}{10}$ lb. per lb. seed without a sticker to 3·3, the corresponding level with a sticker (methocel-Dow methyl cellulose) [cf. ibid., 30, p. 504] being 11·6. Dusting with arasan has entirely superseded the formaldehyde drip treatment in the region under observation.

NYLUND (R. E.). **The response of Onions to soil and foliar applications of manganese and to soil applications of other trace elements.**—*Proc. Amer. Soc. hort. Sci.*, 60, pp. 283–285, 1952. [Received April, 1953.]

Since some growers in the Hollandale area of southern Minnesota have experienced difficulty in growing satisfactory crops of onions in certain fields, preliminary experiments on the effect of trace element applications were conducted on ten farms in 1949. In further experiments in 1950 and 1951 on one farm where increased yields were obtained in 1949, the growth and yield of onions in muck soil (pH 6·9) were improved by soil applications of manganese sulphate [*R.A.M.*, 20, p. 438], the optimum rate being 150 lb. per acre. In 1950 the treated plots yielded 677 50-lb. bags per acre as against 544 for the untreated. In 1951 the corresponding figures were 442 and 183, with 422 for 30 lb. manganese sulphate applied as foliage sprays.

MIYAKE (I.) & HAMADA (M.). **Studies on the bacteriophage specific for Bacillus carotovorus, the causal organism of soft rot of Carrot. (Sequel No. 1.)**—*Ann. phytopath. Soc. Japan*, 16, p. 181, 1952. [Japanese.]

The inhibiting action of the phage specific for *Bacillus carotovorus* [*Erwinia carotovora*: *R.A.M.*, 4, p. 753] was studied on carrot disks (1 by 5 cm.) on sterilized filter paper in Petri dishes. The disks were (1) smeared with 1 ml. of the phage, inoculated with a 24-hour bouillon culture of the bacterium, and incubated at 27° C.; (2) smeared and incubated for three days, the filter paper beneath them was moistened with 0·1 ml. sterile water, then they were inoculated; (3) inoculated and incubated before smearing with the phage. The results after 168 hours showed the first method to be the most satisfactory, producing complete inhibition at 10^{-4} [dilution] and being 10^{-1} to 10^{-2} higher than the two others.

ØDELIEN (M.) & SORTEBERG (A.). **Molybdenmangel hos Salat i karforsøk.** [Molybdenum deficiency in Lettuce in pot experiments.]—*Forskn. Fors. Landbr.*, 3, 1, pp. 69–74, 2 figs., 1952. [English summary. Received April, 1953.]

In a pot experiment carried out in the spring of 1951 at the Agricultural College of Norway, Vollebek, Wheeler's Tom Thumb lettuce grown in sphagnum peat (pH 5·5) displayed severe symptoms of molybdenum deficiency [*R.A.M.*, 31, p. 417], many of the plants dying at an early stage. The disorder was remedied by the addition of ammonium molybdate at the rate of 2·5 mg. per are [119 sq. yds.] or by liming to adjust the pH to 7·5. The total molybdenum content of the dry matter in the peat did not exceed 0·32 p.p.m.

POOLE (C. F.). **Lettuce improvement in Hawaii.**—*Proc. Amer. Soc. hort. Sci.*, 60, pp. 397–400, 1952. [Received April, 1953.]

The newly released lettuce variety Kaala was developed at the Hawaii Agricultural Experiment Station, Honolulu, from a cross between Manoa and Great Lakes. It is adapted to elevations from sea level to 600 ft. and tolerates *Rhizoctonia* bottom rot [*Corticium solani*: *R.A.M.*, 24, pp. 2, 439]. Although significantly superior to Manoa in tipburn resistance it is still inferior to Great Lakes in this respect [ibid., 30, p. 598; 31, p. 588].

Raabe (R. D.) & Pound (G. S.). **Morphology and pathogenicity of Albugo occidentalis, the incitant of white rust of Spinach.**—Abs. in *Phytopathology*, 42, 9, p. 473, 1952.

The sporangial germination of *Albugo* [*Cystopus*] *occidentalis*, the agent of white blister of spinach [in Wisconsin: *R.A.M.*, 32, p. 297], by zoospores is described. The zoospores germinate rapidly, the germ-tube entering a stoma. A profuse intercellular mycelium is formed in the spongy parenchyma, where it gives rise to a sorus. The spread of the pathogen through the host is frequently expedited by the growth of hyphae in the vascular tissues. Antheridia are terminal and the oogonia either terminal or intercalary. Fertilization apparently follows zonation in the oogonium, although many oospores appear to develop parthenogenetically. All attempts at oospore germination were unsuccessful.

Ruiz Castro (A.). **La lucha contra las enfermedades del Viñedo (su estado actual en España).** [The control of Vineyard diseases (the present situation in Spain).] —*Bol. Pat. veg. Ent. agríc., Madr.*, 18, pp. 243–280, 29 figs., 1950 (published 1951). [Received 1953.]

Diseases of minor importance on vine in Spain are caused by *Alternaria vitis* [*R.A.M.*, 24, p. 52], *Botrytis cinerea* [ibid., 31, p. 591], *Capnodium salicinum* [ibid., 27, p. 114], *Coniothyrium diplodiella* [ibid., 6, p. 76], false black rot (*Macrophoma flaccida*) [*Guignardia baccae*: ibid., 15, p. 75], *Penicillium crustaceum*, *Elsinoe ampelina* [C.M.I. map No. 234; *R.A.M.*, 29, p. 287], *Rosellinia necatrix* [ibid., 31, p. 419], *Sterigmatocystis nigra* [*Aspergillus niger*: ibid., 6, p. 76], *Erwinia vitivora* [ibid., 31, p. 473], and court-noué [ibid., 29, p. 201]. Those of economic importance are due to *Plasmopara viticola* [C.M.I. map No. 221], *Uncinula necator* [*R.A.M.*, 20, p. 288], apoplexy (*Stereum hirsutum* var. *necator*) [*S. necator*: ibid., 29, p. 347], *Armillaria mellea* [C.M.I. map No. 143], and *Phytomonas* [*Bacterium*] *tumefaciens* [ibid., No. 137].

Cataluña and Galicia are the regions most severely affected by *Plasmopara viticola*, followed by La Rioja, the Mediterranean coast provinces, and the central region. In years of generalized attacks it is not unusual for the yield to be reduced by more than a quarter in affected areas. The results of experiments designed to determine the relative efficiency of various materials economizing in copper are recapitulated [*R.A.M.*, 23, p. 377; cf. 32, p. 361]. Of three non-copper fungicides dithane was considered to give the best control.

U. necator, present in the country since 1850 and of prime importance in central vine-growing regions, is controlled almost entirely by sulphur [loc. cit.; ibid., 20, p. 288]. For the purpose of economy the use of wettable sulphurs at 1 to 2 per cent. for the early treatments is suggested, also the incorporation of not more than 50 per cent. talc or bentonite in the sulphur dusts for later applications. In some southern regions the final treatment, made during periods of high temperatures, consists of sulphur mixed with finely sifted slaked lime in the proportion of 1:1 or 2:1.

Details are given of control methods for *A. mellea* and *B. tumefaciens*, which is particularly prevalent in Galicia.

Scott (L. E.) & Scott (D. H.). **Further observations on the response of Grape Vines to soil and spray applications of magnesium sulphate.**—*Proc. Amer. Soc. hort. Sci.*, 60, pp. 117–122, 1952. [Received April, 1953.]

In further experiments in Maryland on the effect of soil and foliage spray applications of magnesium sulphate to grape vines [see next abstract] either method was generally effective in correcting or preventing leaf chlorosis and in increasing magnesium in the leaves. Failure to obtain response to soil applications with one selection and to foliage sprays with another were associated with no increase in magnesium in the leaves. Chlorosis [cf. *R.A.M.*, 31, p. 274], apparent only in the

latter part of the season, was generally associated with a leaf magnesium content below 0·18 per cent.

LOTT (W. L.). **Magnesium deficiency in Muscadine Grape Vines.**—*Proc. Amer. Soc. hort. Sci.*, 60, pp. 123–131, 5 diags., 1952. [Received April, 1953.]

The results of three years' experiments on the application of magnesium to grape vines in North Carolina are presented [cf. *R.A.M.*, 28, p. 438 and preceding abstract]. In the first year chlorosis was prevented only by magnesium sulphate injections (500 ml. of 10 per cent. solution). Three years of broadcast application gave the greatest increases in leaf magnesium, though one year of magnesium sulphate plus one year of magnesium acetate was not significantly poorer. None of the treatments increased grape yields.

The results indicate that delayed responses of magnesium-deficient woody plants to soil applications of magnesium sulphate are not the result of its failure to reach the root zone or to remain there long enough to be utilized by the plants.

YARWOOD (C. E.), HALL (ALICE P.), & NELSON (MARJORIE M.). **Nutritive value of rust-infected leaves.**—*Science*, 117, 3039, pp. 326–327, 1 graph, 1953.

Microbiological assay of the primary leaves of Pinto bean (*Phaseolus vulgaris*) infected with rust (*Uromyces phaseoli*) [*U. appendiculatus*: *R.A.M.*, 31, pp. 317, 467; 32, p. 415] revealed a higher pantothenic acid content than in healthy leaves, increasing up to at least 12 days after inoculation, and becoming approximately ten times as great.

In nine trials in which calcium pantothenate was added to a water suspension of crude tobacco mosaic virus inoculum the numbers of local lesions resulting on bean [ibid., 32, p. 170] was consistently greater than those without calcium pantothenate. The optimum concentration seemed to be about 1 per cent., which gave an average of 1·8 times as many lesions as the control. When bean leaves inoculated with tobacco mosaic virus were placed with the inoculated surface on 3 per cent. calcium pantothenate, many more lesions developed than when the leaves were floated on water [ibid., 31, p. 317]. When the experiment was repeated with young primary bean leaves from plants seven to ten days old but floated with their lower surfaces on 3 per cent. calcium pantothenate, the number of local virus lesions was generally greater, the lesions themselves were consistently larger, and the amount of virus seven times greater than in the controls on water. A similar or much greater increase in number or size (or both) of lesions and assayed amount of virus resulted when inoculated leaves were incubated on 0·001 per cent. copper sulphate, 0·01 per cent. zinc sulphate, or 0·00003 per cent. silver nitrate.

BALDACCI (E.). **Una interpretazione dei processi disgenesici dei virus fitopatogenici.** [An interpretation of the dysgenesic processes of phytopathogenic viruses.]—*Ric. sci.*, 22, 3, pp. 471–472, 1952.

The problem of the morphological modifications induced in the organs, notably the leaves, of plants by viruses is discussed in the light of some important contributions to the literature, with special reference to the study of Wildman *et al.* on tobacco mosaic virus [*R.A.M.*, 29, p. 59]. Of the two alternatives advanced by these authors to explain the disappearance of cytoplasmic protein from infected tobacco leaves, that which postulates the synthesis of virus from the complete breakdown products of normal protein is regarded as the more plausible [ibid., 32, p. 218].

KOŘÍNEK (J.). **Inclination to virus diseases, polyploid forms and the ability to form alkaloids.**—*Bull. int. Acad. Prague*, 51 (*1950*), pp. 9–16, 1953.

The author points out that whereas the Solanaceae abound in alkaloids, which

are considered to be waste products of protein metabolism, and are attacked by 18 known viruses, the Labiatae do not form any alkaloids and hardly suffer from viruses. It appears to follow that alkaloid formation and inclination to viruses might be closely associated and this suggestion is examined in relation to other families. Polyploidy and mixoploidy are also common in the Solanaceae and their connexion with virus inclination is carefully examined. However, the Labiatae also are strongly inclined to form polyploid types, thus indicating that the inclination to viruses cannot be related to this feature of protein metabolism. A certain relationship between the formation of alkaloids and the presence of symbiotic fungi may exist in the wild Solanaceae.

It is concluded that alkaloid content, susceptibility to viruses, and polyploidy are three distinct, independent phenomena.

Rodríguez Sardiña (J.). **Examen de los medios de lucha contra los virus. Ensayos españoles de lucha química.** [Examination of the methods of virus control. Experiments in Spain on chemical control.]—*Bol. Pat. veg. Ent. agríc., Madr.*, 18, pp. 129–132, 1950 (published 1951). [Received 1953.]

White Burley tobacco plants were inoculated with tobacco mosaic virus or a strain of potato virus X [*R.A.M.*, 32, p. 61] before being placed in a nutrient solution either unamended or supplemented by various substances. In the unamended solution they exhibited well-defined symptoms. The addition of a mixture of potassium, sodium, and ammonium bromides (10 gm., 5 gm., and 5 gm. in 200 ml. distilled water) [ibid., 29, p. 457] delayed the expression of tobacco mosaic symptoms but seriously reduced plant growth and eventually caused chlorosis. Of the sulphamides tested prontosil (sodium salt of 4-sulphonamidophenylazo-7-acetylamino-1-oxynaphthaline-3, 6-disulphonic acid) was the most promising [cf. ibid., 29, p. 563].

Moore (W. C.). **Principles underlying plant import and export regulations.**—*Plant Path.*, 1, 1, pp. 15–17, 1952.

The author considers that every country should be under an obligation to take all reasonable steps to prevent the export of organisms detrimental to crop plants and to control the importation of plant material likely to introduce pests and diseases. Adequate training of staff is essential for this. Plant import restrictions should be based not on arbitrary rulings but on sound biological grounds.

List of intercepted plant pests, 1951.—*S.R.A., B.E.P.Q., U.S. Dep. Agric.*, 61 pp., 1952. [Received April, 1953.]

The following pathogens were intercepted on plant material entering the United States between 1st July, 1950, and 30th June, 1951 [cf. *R.A.M.*, 32, p. 365]: *Xanthomonas citri*, the largest number (25) of specimens coming from Japan (17 on lemon, six on sweet orange, and one each on pomelo and grapefruit), followed by 20 from China (on sweet orange, pomelo, grapefruit, and mandarin), and 15 from India (on lemon, calamondin orange, and sour lime); *X.* sp., the agent of cancrosis B, was detected six times on lemons from Argentina; *Elsinoe australis* (84) on orange, lemon, and sour lime [C.M.I. map No. 55] from Brazil and on orange and lemon from Argentina (16); leprosis virus on citrus [*R.A.M.*, 30, p. 465; 31, p. 326] once each from Bolivia and Brazil; *Chrysomyxa rhododendri* on cut *Rhododendron* flowers [ibid., 30, p. 585] four and three times, respectively, from Austria and Switzerland, and once from an unknown source, while propagating material from England was also infected; *Gymnosporangium haraeanum* [ibid., 27, p. 258] on Chinese juniper [*Juniperus chinensis*] from Japan (four times); *G. juniperi* [loc. cit.] and *G. juniperinum* [ibid., 27, p. 387] on mountain ash [*Sorbus aucuparia*] from

Norway and Sweden; and *Coniothyrium cytisallum* on *Laburnum* sp. and *C. hellebori* [ibid., 30, pp. 195, 612] on *Helleborus niger* from Holland [ibid., 26, p. 246]; and *Septoria azaleae* on *Rhododendron* from Belgium [ibid., 27, p. 463] and Holland.

Other important fungi were *Botrytis gladiolorum* on *Gladiolus* from Holland, Japan, Austria, and Mexico, and also on *Tritonia* sp. from Holland; *Cercospora handelli* on *Rhododendron* from Holland; *C. kaki* [ibid., 21, p. 99] on persimmon from Japan; and *Mycena citricolor* [ibid., 32, p. 184; C.M.I. map No. 9] on *Gardenia* from Guatemala and Mexico.

There were 534 interceptions of plant diseases on airborne material during the year. Species collected and believed to be new to or not yet established in the United States included *Chrysomyxa rhododendri*; *Colletotrichum cajani* [*Glomerella cingulata*: *R.A.M.*, 11, p. 425] on pigeon pea from Puerto Rico; *Gymnosporangium juniperi* and *G. juniperinum*; *E. australis* and *E. phaseoli*, the latter on Lima bean [*Phaseolus lunatus*: C.M.I. map No. 194] from Puerto Rico; *Phyllosticta passiflorae* on passion fruit [*R.A.M.*, 5, p. 584] from Australia; *Stachylidium* [*Verticillium*] *theobromae* on banana [C.M.I. map No. 146] from Portugal; and *X. citri* [ibid., No. 11] and *X.* sp. Air-introduced pathogens of limited distribution in the United States were *Coniothyrium hellebori*, *Entyloma dahliae* [ibid., No. 114] from Denmark, and *Phakopsora desmium* on cotton [ibid., No. 258] from Puerto Rico.

McKay (R.), Loughnane (J. B.), & Barry (P. J.). **Observations on plant diseases in 1951.**—*J. Dep. Agric. Eire*, 48, pp. 184–192, 1 pl., 1951–52.

During 1951 apple scab (*Venturia inaequalis*) [*R.A.M.*, 31, p. 243] and peach leaf curl (*Taphrina deformans*) [C.M.I. map No. 192] were exceptionally severe in Eire; by early June the latter disease was already very conspicuous on flowering almonds all round Dublin. Black currant rust (*Cronartium ribicola*) [ibid., No. 6], not seen for a number of years, appeared in the autumn of 1951 at the Albert Agricultural College, Glasnevin, Seabrook's Black being very severely infected. Early foci of potato blight (*Phytophthora infestans*) [*R.A.M.*, 26, pp. 210, 414; 29, p. 46; and below, p. 446] in Galway and Sligo at the end of June were on plants growing on the site of old potato pits. Later, the disease became generally prevalent; the marked fungicidal superiority of Bordeaux and Burgundy mixtures [loc. cit.] to proprietary products was clearly demonstrated.

On the Albert College farm the first two sugar beet plants affected with yellows virus [ibid., 27, p. 211] detected in a field in the last week of June, were by the end of September surrounded by a patch of 89 diseased plants. These were harvested on 22nd October together with 89 apparently healthy plants removed from each drill, continuing on from where the diseased plants ended. The weights of tops for the diseased and healthy lots, respectively, were 92 and 125 lb., of washed roots 98½ and 113½ lb., and the sugar content 16·7 and 18·2 per cent. Thus, the loss of tops, roots, and sugar due to the disease was, respectively, 26, 13, and 1·5 per cent. *Cercosporella brassicae* [C.M.I. map No. 197] and *Erysiphe polygoni* [*R.A.M.*, 7, p. 132] were prevalent on swedes.

The most prevalent and serious disease of grain crops was take-all (*Ophiobolus graminis*), which constituted 45 per cent. of all cereal disease samples received, the attacks ranging from slight to over 50 per cent. Many outbreaks occurred on acid soils. Prevalence after a previous grain crop was a very conspicuous feature, and little doubt is entertained that late spring ploughing also contributed. Traces of ergot (*Claviceps purpurea*) [C.M.I. map No. 10] were not uncommon in wheat fields, and the disease was also more prevalent than usual on perennial rye grass [*Lolium perenne*] and cocksfoot [*Dactylis glomerata*]. During 1950–1 no winter wheat was sown on the Albert College Farm until almost the end of February, 1951. All volunteer plants had either been ploughed under by this time or were ploughed under before the new braird appeared. As a result of this break in the continuity of

infection by yellow rust (*Puccinia glumarum*) [*R.A.M.*, 28, p. 619] the entire crop remained unaffected in 1951.

CICCARONE (A.). **Disease outbreaks on economic plants in Italy.**—*F.A.O. Plant Prot. Bull.*, 1, 4, pp. 49–51, 2 figs., 1953.

In February, 1952, olive anthracnose (*Gloeosporium olivarum*) [*R.A.M.*, 29, pp. 572, 603] was reported from the province of Brindisi in Italy. Court-noué [ibid., 17, p. 653] and dead arm disease (*Phomopsis* [*Cryptosporella*] *viticola*) [cf. ibid., 31, p. 473] were prevalent on grape vines, the former in Sardinia, the latter causing serious losses near La Spezia in Liguria. Fig mosaic virus [ibid., 29, p. 267; 32, p. 259] and artichoke (*Cynara scolymus*) powdery mildew (*Ovulariopsis cynarae*) were widely distributed throughout Italy, Sicily, and Sardinia. *O. cynarae*, which was best controlled by applications of wettable sulphur dust till the middle of October followed by shirlan A.G., caused heavy damage to artichokes in the province of Imperia, particularly from October to January, and cardoons (*C. cardunculus*) in the province of Forli, Emilia. Tomato big bud virus [cf. ibid., 30, p. 438], recently recorded for the first time in Italy, was observed on tomatoes in many localities particularly near Rome and Genoa and [tomato] double streak virus [? tobacco mosaic virus plus potato virus X: ibid., 29, p. 178] near Naples where tomatoes alternate with early potatoes. Chloropicrin as a fumigant gave good control of [chilli] pepper wilt (*Verticillium albo-atrum*) [cf. ibid., 5, p. 206; 30, p. 431] which is widespread throughout Italy. *Pythium ultimum* [ibid., 29, p. 492] and *P. splendens* caused much damage in [chilli] pepper and cucumber seedbeds near Rome, while lettuce seedlings [ibid., 25, p. 535] near Genoa suffered great losses as the result of a mixed infection of *P. debaryanum* [C.M.I. map No. 208] with *P. oligandrum*.

The destructive leaf-spot disease of berseem clover (*Trifolium alexandrinum*), provisionally named *Stagonospora recedens* f. *trifolii-alexandrini* [? n.f.], was effectively controlled by mowing the diseased patches of the crop in experimental plots near Rome.

SIBILIA (C.). **Rassegna dei casi fitopatologici più notevoli osservati nel 1949.** [Review of the most noteworthy phytopathological records observed in 1949.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 261–294, 1952.

This report [cf. *R.A.M.*, 25, p. 539] contains, among many others, the following items of phytopathological interest. Olives in the province of Latina, Italy, developed a sudden withering apparently resembling the cases reported from Castelli Romani and Frosinone and probably of virus origin [cf. ibid., 31, p. 246]. Apple leaves at Bolzana were infected by *Phyllosticta prunicola* [cf. ibid., 19, p. 330]. Fig mosaic [virus: see preceding abstract] was found at Rome and in Frosinone, Teramo, and Chieti. Chestnuts at Norma were attacked by ink disease (*Phytophthora cambivora*) [ibid., 27, p. 544]. Chestnut material from Turkey bore *Coryneum perniciosum* [cf. ibid., 18, p. 355], not before recorded in Turkey. *Quercus cerris* showed slight infection by *Endothia parasitica* [ibid., 30, p. 550]; *Q. rubra* [*Q. borealis*] at Turin was affected by an unidentified mildew, possibly *Microsphaera quercina* [*M. alphitoides*: cf. ibid., 32, p. 285], though reputedly highly resistant to the disease [ibid., 30, p. 128].

[JAMESON (J. D.).]. **Outbreaks and new records. Uganda.**—*F.A.O. Plant Prot. Bull.*, 1, 4, p. 62, 1953.

Banana wilt (*Fusarium oxysporum* var. *cubense*) [*R.A.M.*, 32, p. 324] is reported for the first time from Uganda, from four localities. *Puccinia polysora* appears to be widely present on maize throughout the country [ibid., 32, p. 309].

PELEG (J.). **Outbreaks and new records. Israel.**—*F.A.O. Plant Prot. Bull.*, 1, 4, pp. 60–61, 1953.

This is a brief account of the disease situation in Israel during the period from July to September, 1952. *Alternaria* [*solani*: *R.A.M.*, 24, p. 343; 26, p. 137], *Pythium* sp., leaf mould (*Cladosporium fulvum*) [loc. cit.], and stem and root rot (*Sclerotium rolfsii*) [ibid., 30, p. 447] were destructive on tomatoes in the south. Powdery mildew (*Oidium* sp.) [*Erysiphe cichoracearum*] and downy mildew (*Pseudoperonospora cubensis*) [ibid., 26, pp. 130, 477, 478] attacked cucumber and melons early in the season especially where overhead irrigation was practised. Cabbage and cauliflower downy mildew (*Peronospora parasitica*) [ibid., 26, p. 475] was satisfactorily controlled with low concentrations of copper fungicides. Tobacco powdery mildew (*E. cichoracearum*) [ibid., 31, p. 634] was very widespread and serious, affecting as much as 20 per cent. of the leaves in some fields.

MILLER (P. R.) & SASSCER (E. R.). **Plant diseases and insects in the United States.**—*F.A.O. Plant Prot. Bull.*, 1, 4, pp. 56–67, 1953.

The kernel blight phase of oat *Septoria* black stem (*Leptosphaeria avenaria*) [*R.A.M.*, 32, p. 248 and below, p. 426] was widespread throughout the north central States in 1951. The fungus was isolated from blighted kernels that had been stored for over a month, thus indicating the possibility of seed transmission.

The decay of bell type [chilli] peppers due to *Cladosporium herbarum* [ibid., 18, p. 354], which was found in some consignments on the Chicago market during the autumn and early winter of 1952, is best controlled by field and packing-house treatments and careful clearance of all spotted fruits at loading time. Refrigeration below 40° F. retards the development of the decay but does not completely check it.

RAMACHANDRAN (L. K.). **Plant tumours versus animal tumours.**—*J. Madras Univ.*, Sect. B, 22, 2, pp. 268–276, 1952. [Received May, 1953.]

An attempt is made to assess the progress in the study of plant tumours or crown galls (chiefly those produced by *bacterium tumefaciens*) in comparison with that of animal tumours [*R.A.M.*, 32, p. 238].

BORMAN (E. K.). **Conservation of the generic name Bacterium and the family name Bacteriaceae.**—*Int. Bull. bact. Nomencl. Tax.*, 2, 2, pp. 60–63, 1952.

The author criticizes Opinion No. 4 (*Int. Bull. bact. Nomencl. Tax.*, 1, 4, pp. 145–146, 1951), in which it is decided to conserve the generic name *Bacterium*, and proposes that the Commission should first consider whether or not *Bacterium* should be conserved or rejected and, if rejecting it, should proceed to consider the status of other generic names, which are further discussed. He requests the International Committee to reject the above-mentioned opinion and hopes for further discussions and interchange of views.

TAYLOR (J.). **Conservation of the generic name Bacterium and the family name Bacteriaceae. Comments of the Enterobacteriaceae Subcommittee, British Advisory Bacteriological Nomenclature Committee.**—*Int. Bull. bact. Nomencl. Tax.*, 2, 3, pp. 92–93, 1952.

In this comment on Dr. Borman's criticism of Opinion No. 4 [see preceding abstract] the author requests the International Committee to approve the Opinion No. 4, treating it as an exception to Note 3 to Provision 2.

PARHAM (B. E. V.). **Cacao in Fiji—review and prospects.**—*Agric. J. Fiji*, 23, 2, pp. 13–24, 6 figs., 1952.

In this detailed review of the cacao situation in Fiji it is reported that 43 plants, termed green-red podded Java Criollo × Forastero hybrids, raised from three Lafi

No. 7 pods received in December, 1950, from the New Zealand Reparation Estates, W. Samoa, have remained completely free from *Phytophthora palmivora* [*R.A.M.*, 32, p. 71] for three successive seasons. This apparently self-compatible variety appears to be satisfactory from every point of view.

Field experiments, 1950.—*J. Dep. Agric. Eire*, 48, pp. 193–212, 1951–52.

On pp. 204–205 of this report are described further trials carried out in Eire in 1950 with a combination of gammexane [*gamma*-BHC] and an organo-mercurial product (10 oz. per barrel) applied to spring wheat seed at 39 centres and to oats at 47 centres against wireworms and seed-borne fungal diseases. Oats remained comparatively unaffected by the usual diseases, except *Helminthosporium* [*Pyrenophora*] *avenae* [*R.A.M.*, 20, p. 11; 31, p. 593], which was severe in the control plots at six centres, moderately severe at three, and slight at 21. In over 60 per cent. of these the corresponding plots from treated seed were almost unaffected. At three centres, however, treatment was only partially effective. There was a very slight attack of oat loose smut (*Ustilago avenae*) [C.M.I. map No. 238] at eight centres and of covered smut (*U. kolleri*) at one, all these attacks being confined to untreated plots. Wheat bunt (*Tilletia caries*) was present at three centres, at two of which the treated plots remained unaffected; there was a slight attack of [unspecified] seedling blight at 11 centres, at four of which the treated plots were unaffected.

Cotterell (G. S.). **Major pests of crops in Afghanistan: a preliminary note.**—*F.A.O. Plant Prot. Bull.*, 1, 4, pp. 52–55, 1953.

During a survey of plant diseases in Afghanistan in 1952 wheat rusts (*Puccinia* spp.) and loose smut (*Ustilago tritici*) were found to be very common; maize smut (*U. maydis*) [C.M.I. map No. 93] was particularly prevalent in heavily irrigated areas. All cause considerable crop losses.

De Urries (M. J.). **Wheat rusts in Spain in 1952.**—*F.A.O. Plant Prot. Bull.*, 1, 4, pp. 58–59, 1953.

Despite the very varied climatic conditions in Spain, in general spring rains play a decisive part in the development of epidemics of cereal rusts. As a rule wheat losses are of minor importance, averaging about 5 to 10 per cent. a year. In 1951 and 1952, however, the early spring rainy weather and temperatures conducive to rust development resulted in epidemics of black rust (*Puccinia graminis*) [*R.A.M.*, 32, p. 192] which spread with increasing severity over most of the important wheat-growing areas. Considerable losses were also caused by yellow rust (*P. glumarum*) [ibid., 29, p. 201] and minor ones by brown rust (*P. rubigo-vera tritici*) [*P. triticina*: ibid., 31, p. 376]. Of the physiologic races encountered [loc. cit.] the most prevalent in 1951 and 1952 were 17, 21, 14, 24, and 133 of *P. graminis* and 14, 26, 4, and 84 of *P. triticina*.

Thomas (I.). **New cereal varieties in Australia.**—*J. Agric. W. Aust.*, Ser. 2, 28, 1, pp. 32–33, 1951.

A new wheat variety, Lawrence, registered in Australia in 1950, is resistant to all forms of stem rust [*Puccinia graminis*] and leaf rust [*P. triticina*] prevalent in Queensland, which indicates resistance to races 126 and 126B [of stem rust], in addition to the new complex of races recently identified in New South Wales [*R.A.M.*, 30, p. 406; 31, p. 597].

Fischer (G. W.) & Tyler (L. J.). **Is there an earlier record of dwarf bunt than 1931?**—*Plant Dis. Reptr*, 36, 12, pp. 445–447, 1952. [Multilithed.]

From the review of literature on dwarf bunt (*Tilletia brevifaciens*) of wheat in

North America [*R.A.M.*, 32, p. 307] there appears to be some doubt as to its earliest authentic record on the continent. Although the disease was first reported officially in 1931 from Montana [ibid., 14, p. 350], British Columbia [ibid., 29, p. 80], Utah, Idaho [ibid., 25, p. 209], New York, and Washington [ibid., 16, p. 166], more recent studies indicate that it was present in Utah [ibid., 32, p. 15] in the 1920's or even earlier. This claim, however, needs to be confirmed. It is suggested that all collections identified as *T. tritici* and *T. caries* should be restudied.

Whitehead (M. D.) & Dickson (J. G.). **Pathology, morphology and nuclear cycle of two new species of Pyrenophora.**—*Mycologia*, 44, 6, pp. 747–758, 29 figs., 1952.

Two new species of *Pyrenophora* overwintering prevalently on stubble and straw of oats and rye in Wisconsin were connected with their imperfect states; their morphology and cytology are described. *P. alternaria* on oats has perithecia which become flask-shaped by the formation of short ostiolar beaks; they measure 195 to 358 (mean 261·3) μ by 225 to 397 (mean 318) μ and are 212 to 371 (mean 288·8) μ in height with dull golden-brown, curved or crooked setae. The (usually eight) ascospores have 3 to 6, mostly 5, transverse septa, 1 to 5 longitudinal septa, occasionally two longitudinal septa occurring in a spore segment; they are slightly constricted at the septa, and measure 14·3 to 24·3 by 5·7 to 7·6 (mean 10·3 by 7·1) μ. The central septa are formed first, a septum subsequently forming in each of the end segments. Longitudinal septa are then formed in the two central segments, and later transverse septa develop in them. The conidial state is an *Alternaria* with golden-olive to buff conidia 15·6 to 65·5 (mean 40·4) μ, including a beak 3·1 to 18·7 (10·9) by 9·4 to 21·8 (14·8) μ, with 3 to 8 (4·66) transverse and 1 to 8 (2·7) longitudinal septa. In greenhouse tests mycelial fragments and conidia sprayed on to oat plants caused moderately severe leaf killing in 48 hours.

The *Helminthosporium* conidial stage of *P. secalis* and also the ascospores caused a severe leaf spot of rye seedlings. Conidiophores and conidia were produced profusely on the necrotic spots and leaf tips. The perithecia measure 212 to 424 (mean 318) by 424 to 729 (551·7) μ and are 199 to 464 (mean 345·9) μ high. The asci measure 185 to 398 by 31 to 50 (mean 267·1 by 41·7) μ and have one to eight, usually fewer than eight, ascospores, measuring 34 to 67 by 15 to 28 (mean 51 by 21) μ. The *Helminthosporium* conidia are 31 to 165 by 9 to 22 (mean 88·7 by 15·7) μ.

Black stem top Oat disease in 1952.—*Seed World*, 37, 5, pp. 29, 48, 1953.

In 1952 black stem [*Leptosphaeria avenaria*] was the most damaging disease of oats [see above, p. 424] in Illinois and may become a serious threat to oat production there. Since 1947 the disease has been steadily increasing in the mid-west where Ajax, Branch, Clinton, Shelby, and Spooner have shown the greatest resistance [ibid., 32, p. 372].

Simons (M. D.) & Murphy (H. C.). **Kernel blight phase of Septoria black stem of Oats.**—*Plant Dis. Reptr*, 36, 12, pp. 448–449, 1 fig., 1952. [Multilithed.]

In experiments carried out by the Division of Crops and Diseases, United States Bureau of Plant Industry, in co-operation with the Iowa Agricultural Experiment Station on the kernel blight phase of black stem of oats (*Leptosphaeria avenaria*) [see preceding abstract] no evidence of seed transmission was obtained when diseased seed was grown in sterile sand. Infected grain was not toxic to animals.

Floriland Oats.—*Seed World*, 72, 5, p. 37, 1953.

The new early oat variety Floriland [*R.A.M.*, 32, p. 310], a hybrid between Florida 167 and Landhafer, proved resistant to Victoria blight [*Helminthosporium victoriae*: loc. cit.] in Florida.

Vergnano (Ornella) & Hunter (J. G.). **Nickel and cobalt toxicities in Oat plants.**—*Ann. Bot., Lond.*, N.S., 17, 66, pp. 317–328, 1 pl., 1953.

At the Macaulay Institute for Soil Research, Craigiebuckler, Aberdeen, the toxic symptoms produced by nickel and cobalt [*R.A.M.*, 30, p. 245; 31, p. 576] in oat plants in sand culture were demonstrated to be a combination of induced iron-deficiency chlorosis and necrosis, the symptoms produced by the two elements being similar but not identical. The symptoms produced with solutions containing 2·5 and 5 p.p.m. nickel were similar to or identical with those exhibited by oat plants in several areas of Aberdeenshire [ibid., 31, p. 631]. The nickel content of fully expanded leaves was also comparable. The symptoms produced by cobalt in sand culture were similar to but never identical with those found locally and the cobalt concentrations in the culture plants were considerably higher. The anatomical changes produced in the leaves of oat plants by excessive nickel and cobalt, deficient iron, and the abnormal factor in the affected areas were similar but not identical.

Guttenberg (H. v.) & Strutz (Ingrid). **Zur Keimungsphysiologie von Ustilago zeae.** [A contribution to the germination physiology of *Ustilago zeae*.]—*Arch. Mikrobiol.*, 17, 2, pp. 189–198, 1952.

Studies are reported from the Botanical Institute of Rostock University, Germany, on the conditions requisite for spore germination in *Ustilago zeae* [*U. maydis*], using material from smut balls on Pomeranian maize. Of the various growth substances added to tap water (in which no germination occurs), the most effective were heteroauxin and nicotinic acid at 10^{-6} to 10^{-7}, both permitting 75 per cent. germination [cf. *R.A.M.*, 18, p. 18]. In another series of tests on Halbsguth's inorganic medium [ibid., 29, p. 16] the degree of purity of the glucose used as an admixture proved to be a decisive factor, certain specially purified commercial brands promoting abundant germination without the addition of growth substances, whereas sugar treated with ether was useless for the purpose in view. The percentages of spore germination on maize and oat plant extracts were 100 and 10, respectively, suggesting the presence in the former of a stimulatory substance. The growth substance residing in the galls and smut balls of *U. maydis* was shown by the *Avena* coleoptile test to be heteroauxin.

Josephson (L. M.). **'Crazy-top' of Maize in South Africa.**—*Fmg in S. Afr.*, 28, 322, pp. 4, 36, 2 figs., 1953.

In June, 1952, a single maize tassel of the variety Iowa Silver Mine received from Sandspruit, eastern Transvaal, bore an abnormality typical of crazy top in the United States [*R.A.M.*, 26, p. 241]. After planting early in October the crop had received six inches of rain during the rest of the month followed by nineteen days' dry weather during which the soil remained waterlogged beneath a heavy crust. Emergence occurred only after harrowing. A similar abnormality has also occurred in American White Flint at Bethlehem Experiment Station, Orange Free State. No organism could be detected in the affected specimens but the symptoms resembled those of maize downy mildew (*Sclerospora indica*) [*S. philippinensis*: ibid., 15, p. 794] present along the Natal coast and in parts of the Transvaal.

Rogers (J. S.) & Collier (J. W.). **Corn production in Texas.**—*Bull. Tex. agric. Exp. Sta.* 746, 76 pp., 11 figs., 1 diag., 2 graphs, 3 maps, 1952.

This account of the various aspects of maize production in Texas includes a section (pp. 31–36) on diseases [*R.A.M.*, 24, p. 355].

Ciccarone (A.). **Alcune osservazioni su Cercospora sorghi E. et E.** [Some observations on *Cercospora sorghi* E. & E.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (1950), pp. 59–67, 1 pl., 2 figs., 1952. [English summary.]

This paper on *Cercospora sorghi* on sorghum in Venezuela has already been noticed from another source [*R.A.M.*, 29, p. 615].

Wallace (J. M.). **Psorosis reduces Citrus yields.**—*Calif. Citrogr.*, 38, 3, pp. 83, 100–102, 1 fig., 1953.

The data obtained in 1943 and 1944 regarding citrus yield losses in California resulting from the psorosis virus [*R.A.M.*, 24, p. 56] are recapitulated. Present evidence indicates that neither transmission of the virus through seeds nor infection by insect feeding is responsible for any significant amount of psorosis. Certain Californian plantings contain nearly 100 per cent. affected trees, most of them producing unprofitable crops by the time they were 20 years old. Such losses can be averted only by planting trees budded from psorosis-free parent trees, i.e., those provided by the Bureau of Nursery Service of the California State Department of Agriculture. It appears at present that the Californian citrus industry will have to change to both new rootstock varieties and scion selections to overcome many current diseases and disorders [see next abstract].

Bitters (W. P.). **Stem pitting in Citrus trees.**—*Calif. Citrogr.*, 38, 1, pp. 3, 26; 4 figs., 1952.

Although workers in South Africa [*R.A.M.*, 30, p. 267] and Brazil [ibid., 32, p. 18] have demonstrated that citrus stem-pitting and tristeza are interrelated and probably only different symptom expressions of the same virus complex, stem-pitting was not observed in Californian orchards affected by quick decline [ibid., 32, p. 251] until 1952. The progress of the disease in California, although much slower than that of tristeza, is following a course similar to that in Brazil. While only sweet orange tops on sour orange roots have shown quick decline in old orchards so far, experimental trials indicate that many other combinations are likely to prove susceptible.

Rootstock plantings were made in 1945, 1946, 1948, 1950, 1951, and 1952 and stem pitting has appeared only in naturally infected Morton citrange stock budded with sweet orange tops in 1945 and extends only to the crown roots. The 1948 planting of this combination is also showing some effect of inoculation, but no stem pitting has appeared so far.

The disorder is characterized by the inability of the cambium and wood to develop normally in localized areas, resulting in the development of small pits and depressions. In contrast small masses of tissue develop in place of some of the normal bark elements, producing peg-like growths on the inner surface of the bark. In advanced stages the pits coalesce into irregular grooves following the grain of the wood. With stem-pitting, in contrast to quick decline and tristeza, normal development of part of the xylem appears to be restricted, while the growth of certain phloem elements is stimulated. Of 19 Valencia trees on Morton citrange in an orchard in the Azusa area examined in spring, 1952, 16 were showing stem pitting symptoms on the stock. A large percentage of Morton citrange stocks grafted with young navel orange were also affected. On the other hand seven-year-old navels and Valencias planted in 1945 and 24-year-old navels, both on Morton stocks at Riverside, are apparently healthy.

Since Californian growers are now faced with the prospects of both quick decline and stem-pitting, the combinations on which the latter may occur must be determined. The importance of planting only combinations known to tolerate quick decline cannot be over-emphasized.

Steyaert (R. L.). **La tristeza des Agrumes.** [Tristeza of Citrus.]—*Fruits d'outre mer*, 7, 11, pp. 534–536, 4 figs., 1952. [Received 1953.]

This is a summary of an article by the same author in *Bull. agric. Congo belge*, 43, 2, pp. 399–446, 1952, giving current knowledge of citrus tristeza.

Chapot (H.). **Le 'quick decline' existe en Floride et peut-être aussi à Madagascar.** [Quick decline occurs in Florida and probably also in Madagascar.]—*Fruits d'outre mer*, 7, 10, pp. 476–477, 1952.

The author reviews the situation in Florida since the discovery there of citrus quick decline and gives reasons for believing it to be present in Madagascar also.

Beyers (E.) & Joubert (G. F.). **Mineral deficiencies in Citrus in the Citrusdal area.**—*Fmg in S. Afr.*, 27, 320, pp. 508–510, 3 figs., 1952.

Notes are given on the incidence, symptoms, and control of copper [see next entry], zinc [*R.A.M.*, 22, p. 252], magnesium [ibid., 20, p. 531], manganese, and multiple nutrient deficiencies affecting citrus in the Citrusdal area of the western Cape Province, South Africa.

Singh (M. P.) & Singh (R. P.). **Studies on dying-back in Citrus.**—*Indian J. Hort.*, 10, 1, pp. 1–8, 1953.

Mandarins, sweet orange, and to a lesser extent grapefruit at the Fruit Research Station, Saharanpur, India, showed dying-back, probably due to exanthema (copper deficiency) [*R.A.M.*, 25, pp. 27, 66, and preceding entry].

Some abnormalities of Citrus.—*Agric. Gaz. N.S.W.*, 63, 11, pp. 592–595, 11 figs., 1952.

Notes are given on some physiological or environmental disorders of citrus in New South Wales often confused with parasitic diseases.

Alexander (C. C.) & Walsh (D.). **New chemical agent makes possible complete control of iron chlorosis.**—*Agric. Chemic.*, 7, 7, pp. 36–38, 5 figs., 1952.

Working at the Florida Citrus Experiment Station, Lake Alfred, I. Stewart and C. D. Leonard found that a combination of salts of ethylenediamine tetraacetic acid (EDTA) with a deficient mineral (in this case iron) applied to the soil at the base of iron deficient orange trees during the dormant season produced deep green leaves and luxuriant growth the following spring. Some of the treated trees bloomed three weeks before untreated ones.

Camp (A. F.), Chapman (H. D.), & Parker (E. R.). **Clé des symptomes de déficience des Agrumes.** [A key to the symptoms of deficiency in Citrus.]—*Fruits d'outre mer*, 7, 10, p. 494, 1952.

Wager (V. A.) & Ripley (L. B.). **Sooty mould in Citrus.**—*Fmg in S. Afr.*, 27, 319, p. 468, 2 figs., 1952.

Directions are given for the control of citrus sooty mould (*Capnodium salicinum*) [cf. *R.A.M.*, 1, p. 58; 30, p. 263] by destroying the aphids and scale insects which excrete the honey dew on which the fungus lives [cf. ibid., 32, p. 184].

Wager (V. A.). **Melanose, stem-end rot, and shell-bark of Citrus.**—*Fmg in S. Afr.*, 28, 322, pp. 28–30, 33, 5 figs., 1953.

Melanose, stem-end rot, and shell bark of citrus in South Africa are all caused by *Phomopsis* [*Diaporthe*] *citri* [*R.A.M.*, 29, p. 289 and next entry]. Melanose causes many fruits to be culled in the packing-house. Almost the entire crop was culled

on a farm in the eastern Transvaal in 1951. The disease is particularly severe in the eastern and northern Transvaal and in Natal, affecting navel and Valencia oranges, grapefruits, lemons, limes, and tangerines. In spraying experiments against black spot [*Guignardia citricarpa*] with 2–1–80 Bordeaux mixture [ibid., 32, p. 373] excellent control of melanose was secured. The trees are sprayed three times at six-week intervals, four times at four-week intervals if the season is particularly wet at the beginning, or twice at three-week intervals if only melanose is present.

Stem-end rot is not serious in South Africa; control is as for melanose.

Shell bark was usually found in conjunction with melanose. Attempts at control in Natal have been unsuccessful. It is essential that dead wood should be continually pruned out.

Moreau (C.) & Moreau (Mireille). **Phomopsis citri Faw. Mélanose des Agrumes.** [*Phomopsis citri* Faw. Citrus melanose.]—*Rev. Mycol.*, 17, *Suppl. colon.* 2, Fiche 8, 6 pp., 3 figs., 1952.

Brief notes are given on the salient features of *Diaporthe citri* and the disease it causes [see preceding abstract].

Lauriol (Mlle F.). **La protection des Agrumes contre les moisissures à Penicillium.** [The protection of Citrus against *Penicillium* moulds.]—*Fruits d'outre mer*, 7, 10, pp. 465–475, 8 figs., 6 graphs, 1952.

In experiments in Paris citrus rots caused by *Penicillium italicum* and *P. digitatum* [cf. *R.A.M.*, 31, p. 431] were controlled best by soaking the fruits in 10 per cent. sodium borate solution at 45° to 50° C., coating with a protective emulsion, and wrapping in diphenyl-treated paper if the wax coating gave insufficient protection.

Satyanarayana (G.) & Kalyanasundaram (R.). **Soil conditions and root diseases. V. Symptomatology of wilted Cotton and Red Gram.**—*Proc. Indian Acad. Sci.*, Sect. B, 36, 2, pp. 54–58, 1 pl., 1952. [Received April, 1953.]

In studies at the University Botany Laboratory, Madras, on symptom expression in cotton and red gram (*Cajanus cajan*) plants inoculated with *Fusarium vasinfectum* and *F. udum*, respectively, wilt symptoms appeared in the cotton varieties M. 9 and K. 2 on the seventh and thirteenth day after germination, respectively, as very distinct vein-clearing visible to the naked eye in cotyledonary leaves. Red gram displayed general and distinct chlorosis on the eighteenth day after inoculation.

Sulochana (Miss C. B.). **Soil conditions and root diseases. VI. Germination of conidia of Fusarium vasinfectum in micro-element amended soils.**—*Proc. Indian Acad. Sci.*, Sect. B, 36, 6, pp. 229–233, 1952. [Received April, 1953.]

In the present contribution [see preceding entry] the percentage germination of conidia of *Fusarium vasinfectum* isolated from cotton in all soil samples amended with various micro-elements, except manganese at 50 p.p.m., was much lower than in the unamended control soil. Zinc, molybdenum, lithium, aluminium, nickel, boron, cobalt, and manganese were inhibitive in that order.

Sulochana (Miss C. B.). **Soil conditions and root diseases. VII. Response of Cotton plants to micro-element amendments and its relation to disease development.**—*Proc. Indian Acad. Sci.*, Sect. B, 36, 6, pp. 234–242, 1952. [Received April, 1953.]

In further experiments at the University Botany Laboratory, Madras, the incidence of cotton wilt (*Fusarium vasinfectum*) [see preceding entries] was reduced in zinc-amended soils but aggravated by treatment with manganese.

Knight (R. L.). **The genetics of blackarm resistance. IX. The gene B_{6m} from Gossypium arboreum.**—*J. Genet.*, 51, 2, pp. 270–275, 1953.

In further studies at the Research Division, Sudan Ministry of Agriculture, on the genetics of resistance in cotton to blackarm (*Xanthomonas malvacearum*) [*R.A.M.*, 30, p. 609] a gene, B_{6m}, intensifying resistance was transferred from *Gossypium arboreum* to Sakel cotton (*G. barbadense*). By itself, B_{6m} confers no resistance, but in *G. arboreum* it is associated with gene B_4.

The gene B_2 [ibid., 32, pp. 374, 376] is stronger than B_4 when both are transferred to Sakel, and B_{6m} is, accordingly, being transferred to commercial synthetic blackarm-resistant Sudan Sakel and Upland (*G. hirsutum*) types carrying B_2 and B_3. In these combinations B_{6m} confers a resistance closely approaching immunity in the Sudan, which appears to be retained under Uganda conditions.

Hahn (H.). **Das Verhalten resistenter und anfälliger Leinsorten gegenüber Colletotrichum lini Mains et Bolley.** [The reaction of resistant and susceptible Flax varieties to *Colletotrichum lini* Manns & Bolley.]—*Phytopath. Z.*, 20, 1, pp. 83–88, 9 figs., 1952.

In studies at the Fibre Research Institute, Niedermarsberg, Westphalia, Germany, *Colletotrichum lini* [*C. linicola*], the agent of flax anthracnose [*R.A.M.*, 32, p. 186], was found to penetrate through the cuticle into the epidermal cells of susceptible varieties, such as Lusatia. There it forms antler-like haustoria and after a few hours' interval spreads through and kills the entire plant. In resistant varieties like R 569/2 the necrosis of the invaded host cells simultaneously involves the pathogen. The conidia of *C. linicola* germinate equally well in the expressed sap of resistant and susceptible varieties, so that the reaction of the former is evidently of an active character and not merely due to the presence of substances antagonistic to the parasite or the absence of those essential to its existence. Semi-resistant varieties, represented by R 1076/13, contract the same cotyledonary symptoms as susceptible ones, while the reaction of the other parts of the plant is of a resistant type.

Sharma (O. P.) & Nema (K. G.). **A short note on Pythium aphanidermatum (Eds.) Fitz. on Linum grandiflorum Linn.**—*Nagpur agric. Coll. Mag.*, 26, 1–4, p. 17, 1952.

In December, 1950, *Pythium aphanidermatum* was isolated from damped-off seedlings of *Linum grandiflorum* at Nagpur, India, this being a new host for the fungus. In inoculation experiments it caused pre- or post-emergence damping-off of *L. grandiflorum* and flax [*R.A.M.*, 24, p. 450], according to whether the soil was inoculated prior to or at the time of sowing.

Lyle (E. W.). **Control of moulds on Rose bushes in cold storage.**—*Down to Earth*, 8, 2, p. 12, 2 figs., 1952.

In studies on the control of moulds (*Penicillium*, *Botrytis*, and *Rhizopus* spp.) on dormant rose bushes in cold storage vaults (32° F.) at the Texas Rose Research Foundation, DHA–S [*R.A.M.*, 30, p. 183], at concentrations up to 1 in 100, was found to be safe on plant tissue and most effective in preventing mould development especially when a wetter was added. Dowicide A [ibid., 31, p. 543] also showed exceptional promise.

Gigante (R.). **Una forma di mosaico del Geranio.** [A form of mosaic of Geranium.] —*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 213–219, 2 figs., 1952. [English summary.]

On the leaves of a *Pelargonium zonale* plant growing in a garden near Rome

scattered pale green or yellowish areas were observed, mostly circular, some polygonal, ranging in size from dots to spots 3 to 4 mm. in diameter, and sometimes becoming confluent. There was no sign of leaf curl. The leaves were small and the branches shortened, the whole plant appearing dwarfed. The disease was transmitted by grafting but not by sap inoculations.

The chlorotic areas of affected leaves were thin, the palisade cells being shortened, sometimes isodiametrical, and the spongy mesophyll compacted. The chloroplasts were pale, often irregular, and in some cells lacking. In the parenchyma of the midrib and stalk were groups of necrotic cells separated from the healthy ones by several cork layers.

The disease is considered to be due to a virus [cf. *R.A.M.*, 28, p. 575; 29, p. 466].

Alvarez García (L. A.). **A new disease of Orchids in Puerto Rico : Pythium black rot.**—*J. Agric. Univ. P.R.*, 35, 4, pp. 126–135, 8 figs., 1951. [Received March, 1953.]

In November, 1949, during cool, humid weather, reports were received of a black rot of *Laelio-Cattleya* and *Cattleya* orchids growing in greenhouses and outdoors in the Metropolitan Area of Puerto Rico. Pieces of diseased tissue from *Cattleya*, *Laelio-Cattleya*, and *Oncidium* plated on to maize-meal agar yielded a strain of *P. ultimum* [*R.A.M.*, 29, p. 308] identical with the organism causing damping-off of [chilli] pepper seedlings in the Station grounds. *Cattleya* pseudobulbs and leaves, inoculated by various methods with cultures of the fungus, developed typical infection in five to seven days, favoured by 80 to 90 per cent. relative humidity for at least two to three days and temperatures of 20° to 30° [C.]. *C. bowringiana*, *C. skinneri*, *C. gigas*, *C. mossiae*, *C. percivaliana*, *C. gaskeliana*, *C. trianae*, and *C. dowiana aurea* were susceptible.

Infected pseudobulbs were removed and the plants sprayed with parzate and dithane Z-78 at 2 lb. to 100 gals. water every other week. Other plants were sprayed with 2–3–50 Bordeaux and copper A compound (2–100). No further symptoms were observed for eight months on plants left outdoors. No infection occurred on plants similarly treated but sprayed with water and kept in a greenhouse at 50 to 60 per cent. relative humidity. Greenhouse plants artificially infected but not treated showed no spreading of infection to other pseudobulbs or leaves, whereas infected plants succumbed when kept outdoors at 80 to 90 per cent. relative humidity.

Murakishi (H. H.). **Some observations on effect of chemotherapeutants and fungicides on Vanda Orchid seedlings.**—*Bull. Pacif. Orchid Soc. Hawaii*, 11, 1, pp. 7–10, 2 figs., 1953.

In tests at the Hawaii Agricultural Experiment Station arasan (1 : 2,000) alone of all the chemotherapeutants used gave good control of root rot (*Fusarium* sp.) [cf. *R.A.M.*, 30, p. 468] in *Vanda* seedlings without causing any root injury. Pots containing 40 to 50 seedlings were immersed in the chemical bath for 20 to 30 minutes, the treatment being repeated two or three times at three-weekly intervals.

Gianfagna (A.). **Para-dichlorobenzine controls Botrytis on Lily blooms in low temperature.**—*N.Y. St. Flow. Gr. Bull.* 90, pp. 1–2, 1 fig., 1953.

In studies at the Department of Floriculture, Cornell University, New York, PDB (para-dichlorobenzene, 2½, 5, and 10 gm. per 23-l. storage container) [cf. *R.A.M.*, 19, p. 618; 31, p. 329] at 31° F. was the only treatment to give satisfactory control of a *Botrytis* sp. on lily blooms [cf. ibid., 31, p. 119], the number of lesions appearing per 1·5 sq. in. flower sprayed with spores being 27, 8·7, and 9·2, respectively, as against 58·9 for unfumigated blooms given spore treatment. The

pin point, barely visible lesions produced by the 5 gm. concentration were considered for all practical purposes insignificant. In several replicate trials PDB completely prevented spots and also arrested the development of lesions on pre-infected blooms placed in storage. Carnations and snapdragons [*Antirrhinum*] were tolerant of PDB (5, 10, and 30 gm. per 15-l. container) for 10 days at 40° and 18 days at 31°, but roses, chrysanthemums, China asters [*Callistephus chinensis*], and gladioli were badly injured.

Mezzetti (A.). **Il marciume del pedale della Calla prodotto dal Bacterium aroideae (Town.) Stapp in Italia.** [Basal rot of Calla caused by *Bacterium aroideae* (Town.) Stapp in Italy.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 45–58, 4 figs., 1952. [English summary.]

This paper on basal rot of Calla lilies (*Zantedeschia aethiopica*) caused by *Bacterium* [*Erwinia*] *aroideae* has already been noticed from another source [*R.A.M.*, 31, p. 17].

Magie (R. O.), Smith (F. F.), & Brierley (P.). **Occurrence of western Aster yellows virus infection in Gladiolus in eastern United States.**—*Plant Dis. Reptr*, 36, 12, pp. 468–470, 1 fig., 1952. [Multilithed.]

A 'grassy top' and 'hairy root' condition was observed in several acres of Picardy *Gladiolus* near Palmetto and in Fort Myers, Florida, in 1952, also in Hopman's Glory near Bradenton, Florida, and Picardy in Alabama. All the corms had been received from southern Oregon. Two of nine Oregon-grown Picardy corms received at the Plant Industry Station, Beltsville, Maryland, developed typical symptoms. From these plants *Macrosteles divisus* transmitted aster yellows virus [*R.A.M.*, 28, p. 46; 31, p. 48] to China asters [*Callistephus chinensis*]. The disease was also transmitted to *Zinnia* and celery, both known to be susceptible to the western strain of aster yellows virus, but immune from the eastern strain. The disease is of minor importance on *Gladiolus*, but may become a serious menace to celery and *Zinnia* if established in the eastern United States. Neither strain of the virus has been found in southern Florida and introduction of diseased material should be avoided.

Anderson (C. G.), Young (R. A.), & Palm (E. T.). **Curvularia on Gladiolus in Oregon.**—*Plant Dis. Reptr*, 36, 12, p. 474, 2 figs., 1952. [Multilithed.]

A *Curvularia* sp. resembling *C. lunata* [*R.A.M.*, 13, p. 475; 31, p. 490] was found on stored *Gladiolus* corms in several localities in Oregon in December, 1951, and March, 1952, affecting the Pellegrini, Cotillion, and Spic and Span varieties.

Haasis (F. A.). **Soil fumigation with chlorobromopropene for control of Sclerotium rolfsii in Dutch Iris.**—*Plant Dis. Reptr*, 36, 12, pp. 475–478, 1952. [Multilithed.]

Soil fumigation with chlorobromopropene (two applications of 15 and 5 gals. per acre, respectively), carried out at the Vegetable Research Laboratory near Wilmington, North Carolina, for the control of Dutch iris crown and stem rot (*Sclerotium rolfsii*) [*R.A.M.*, 23, p. 181] reduced the percentage of infected bulbs from 32 to 8·1. When the bulbs were steeped in formalin before planting the total yields from fumigated and non-fumigated soil did not differ significantly, but without formalin treatment the mean number of bulbs harvested from fumigated soil was reduced to 229 as against 413 from non-fumigated soil. This indicates the danger of soil fumigation when a second pathogen is introduced. Here a species of *Fusarium*, probably *F. oxysporum* [ibid., 12, p. 374], was apparently carried on untreated bulbs at planting and, in the absence of natural inhibitors, reduced the yield.

Bache-Wiig (Sara). **Further notes on Cryptomycina pteridis.**—*Mycologia*, 44, 5, pp. 705–708, 1952.

Further studies in the Department of Botany, Smith College, Northampton, Massachusetts, on the leaf roll of bracken (*Pteridium latiusculum*) caused by *Cryptomycina pteridis* [*R.A.M.*, 19, p. 485] demonstrated that infection of young fronds of mature plants may be caused by ascospores as well as by conidia. The symptoms that result from inoculation with ascospores resemble the localized lesions caused by inoculation with conidia. The production of conidial cirrhi is alike in the two cases. There is the same rapid invasion of the host tissues, with similarity in the invading mycelia and the appearance of the host cells.

Farinha (Manuela) & Rosado (J. M.). **Morphological, anatomical and cultural characters of Polyporus ulicis Boud.**—*Bol. Soc. broteriana*, Sér. 2, 26, pp. 193–201, 2 figs., 1952.

A full anatomical description is given of *Polyporus ulicis*, a rare parasite of *Ulex europaeus* recorded from Biarritz and Biville (Manche), France, and recently in Portugal [as *Xanthocrous* [*Fomes*] *ribis* f. *ulicis*: *R.A.M.*, 31, p. 93].

Protsenko (E. P.). О паразитном грибе на **Mahonia aquifolium Nutt.** [A parasitic fungus on *Mahonia aquifolium* Nutt.]—Бюлл. бот. Сада [*Bull. bot. Gdn, Moscow*], *1950*, 6, pp. 50–53, 2 figs., 1950. [Received May, 1953.]

Cumminsiella sanguinea, not previously recorded on *Mahonia aquifolium* [*R.A.M.*, 31, p. 594] in the U.S.S.R., was observed on the old leaves of some imported plants at the quarantine nursery of the Central Botanical Garden, U.S.S.R., in 1949. The fungus was also reported from the Raivol region in 1940 and 1941.

Protsenko (E. P.) & Protsenko (A. E.). Кольцевая мозаика Сирени — инфекционное заболевание. [Ring mosaic of Lilac—an infectious disease.]—Бюлл. бот. Сада [*Bull. bot. Gdn, Moscow*], *1950*, 5, pp. 46–50, 4 figs., 1950. [Received May, 1953.]

Various types of speckle, ring mosaic, and leaf curl were observed on lilac leaves [cf. *R.A.M.*, 19, p. 303; 30, p. 520; 31, p. 328] at the quarantine nursery, U.S.S.R. Academy of Sciences Central Botanical Garden, in 1948. Leaf curl was accompanied by yellow necrosis of the leaf edge and ultimately of the whole blade, extreme brittleness of the leaf, and abundant accumulation of starch.

Ring mosaic was transmitted by grafting to 11 out of 15 shoots, thus confirming the infectious, virus nature of the disease. Speckle and leaf curl appeared to be independent of grafting.

McKenzie (R. E.), Heinrichs (D. H.), & Anderson (L. J.). **Hay and crude protein yields, winter hardiness and wilt resistance of Alfalfa varieties.**—*Sci. Agric.*, 32, 12, pp. 626–633, 1 graph, 1952.

During the 1950 lucerne variety trials for resistance to bacterial wilt [*Corynebacterium insidiosum*: *R.A.M.*, 32, p. 63] at the Dominion Experimental Station, Swift Current, Saskatchewan, Canada, Ladak [ibid., 27, p. 24], showing 1·28 infection in the range of 0 (no infection) to 5 (most severe infection), appeared to be the variety best suited for both irrigated and dry land. Ranger [loc. cit.] and Buffalo [loc. cit. and ibid., 27, p. 121], however, were both superior in resistance (0·23 and 0·53 infection, respectively), but the former would be satisfactory on irrigated land, where wilt infection may be severe, only if care is taken to minimize winter injury.

Pohjakallio (O.), Salonen (A.), & Relander (Eeva). **Investigations into the micro-organisms limiting damage by the Clover rot fungus.**—*Acta Agric. scand.*, 3, 1, pp. 53–60, 2 figs., 1 diag., 1953.

Samples of bacteria from living and withered leaflets of clover from different parts of Finland were all found to be antagonistic to the clover rot fungus (*Sclerotinia trifoliorum*) [*R.A.M.*, 29, p. 621; 32, p. 383]. The A1 strain (probably *Pseudomonas* sp.) exerted a similar effect on all the seven *S. trifoliorum* isolates studied, including one from Finland, one from Canada, and five from Sweden, and on one Finnish isolate of *S. sclerotiorum*. The antibiotic effect of A1 was clearly observed on agar extracts from *Trifolium pratense* and *T. hybridum*, it was weak on that of *T. repens*, and imperceptible on that of *T. medium*.

One week's cultivation of the antibiotic bacterium rendered the clover extract agar unsuitable for *S. trifoliorum*, the sclerotia of which were found to be parasitized by certain fungi (*Fusarium* sp., *Mucor* sp., and others).

Smith (J. D.). **A patch disease of sports turf caused by Ophiobolus graminis var. avenae E. M. Turner.**—*J. Sports Turf Res. Inst.* (formerly *J. Bd Greenkeep. Res.*), 8, 28, pp. 140–143, 2 pl. (facing p. 210), 1952. [Received May, 1953.]

In autumn, 1951, and during 1952 a turf disease characterized by small, bleached and sometimes bronzed patches, increasing gradually from a few inches across, was observed in many parts of Great Britain. As the grass in the centre dies out it is replaced by weeds, the diseased grass at the edge of the patch appearing as a bleached ring. The symptoms are particularly noticeable during summer and autumn. Plants examined from September to the following April are discoloured at the base, as are also the stolons and rhizomes, and black perithecia are visible beneath the lower leaf sheaths. So far the disease has been observed on *Agrostis tenuis*, *A. stolonifera*, and *Poa annua*, but not on *Festuca* spp.

The ascospore measurements of all the isolates obtained so far agree with those of *Ophiobolus graminis* var. *avenae*, the identification being confirmed by Dr. E. M. Turner, but so far none has infected the seminal roots of seedling oats [*R.A.M.*, 30, p. 462]. The method of infection resembles that of *O. g.* var. *avenae* on oats. In most cases the disease occurs on soils having a pH of 5 to 6·9 (average 6·1).

Control methods recommended at present are either the re-turfing or re-sowing of patches rather larger than the diseased area or treatment with 2 oz. proprietary mercurial in 6 gals. water to 40 sq. yds.

Wenzl (H.). **Die Überwallung von Schnittwunden an Obstbäumen in Abhängigkeit von Jahreszeit und Wundbehandlung.** [The occlusion of pruning wounds on fruit trees in relation to the season and mode of wound treatment.]—*PflSch-Ber.*, 10, 3–4, pp. 40–50, 1 fig., 1953. [English summary.]

The results of experiments near Vienna on apple, plum, and various ornamental trees confirmed Zecha's observation (*Gartenbauwiss.*, 2, pp. 271–280, 1929) that callus is formed less freely round wounds inflicted in the course of autumn pruning operations than in the case of similar injuries in the spring unless a wax or wax-tar dressing is applied to promote the process of occlusion. Wound dressings applied in the autumn are therefore considerably more advantageous than those applied in the spring.

Ford (O. W.) & Burkholder (C. L.). **Mercury spray residues—their estimation on Apples at harvest time.**—*Agric. Chemic.*, 7, 7, pp. 44–47, 123, 1 graph, 1952.

Chemical tests at Purdue University, Lafayette, Indiana, during 1949 and 1950 indicated that although a single spray of a mercury fungicide (tag and puratized in these tests) left small but measurable mercury residues on apple fruits [cf.

R.A.M., 31, p. 611] immediately after the spray dried the amount of residue at harvest is not likely to be more than a few p.p. 1,000 m., unless the trees are sprayed late in the season. The tests showed that mercury residues are dissipated by rain, and possibly by high orchard temperatures and the catalyzing action of light.

WADE (G. C.). **Ripe spot and target spot of Apples.**—*Tasm. J. Agric.*, 24, 1, pp. 14–19, 3 figs., 1953.

Descriptions are given of the symptoms and control of apple 'ripe spot' or 'target spot', one of the most serious apple diseases in Tasmania, which caused as much as 30 per cent. fruit infection in some properties in 1951 to 1952. The disease is believed to be due to either *Neofabraea malicorticis* [*R.A.M.*, 32, p. 83] or *N. perennans* [ibid., 31, p. 560].

HIROE (I.). **Phytopathological studies on black spot disease of Japanese Pears. (1)**—*Ann. phytopath. Soc. Japan*, 16, 3–4, pp. 127–131, 1952. [Japanese, with English summary. Received March, 1953.]

The author presents the results of pathological and physiological researches undertaken at Tottori University, Japan, on culture filtrates of *Alternaria kikuchiana*, the agent of black spot of pears in Japan [*R.A.M.*, 32, p. 134]. Only culture filtrates of the black spot agent and not of various other fungi tested were able to produce the characteristic symptoms of the disease. There was a direct correlation between disease incidence and the toxicity of culture filtrates and the protoplasmic specificity of the host. Because of this marked sensitivity to culture filtrates of *A. kikuchiana* the term 'hypersensitive disease of plants' is suggested for this type of disease.

HEYNS (A. J.). **Gummosis of stone fruit trees.**—*Fmg in S. Afr.*, 28, 322, pp. 34–36, 7 figs., 1953.

Gummosis canker is prevalent in most apricot orchards of the Western Province, South Africa [*R.A.M.*, 29, p. 290], affecting particularly three- to six-year-old trees. Young cankers and some leaf spots yielded bacteria related to *Pseudomonas cerasi* var. *prunicola* [*P. syringae* f.sp. *prunicola*: ibid., 32, p. 365], causing bacterial canker of stone fruit trees in America [ibid., 32, p. 25] and Australia [ibid., 28, p. 406]. Since the organism was pathogenic when inoculated to young apricot trees and produced symptoms similar to those of bacterial canker the diseases are presumed to be identical.

Until the results of current investigations on control are known growers are advised not to layer or plant trees in poorly drained soil, to prune as late as possible, and destroy all dead and gumming branches at sight, disinfecting the saw with 1 in 10 formalin and covering the surface of large wounds with a suitable protectant.

BIRAGHI (A.). **Una probabile nuova virosi del Pesco.** [A probable new virosis of Peach.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 69–73, 2 figs., 1952. [English summary.]

The information in this paper describing what is probably a new virus disease of peach trees in Italy has already been noticed from another source [*R.A.M.*, 29, p. 315].

KITAJIMA (H.). **Studies on the dissemination of Peach anthracnose. III. Histopathological observation.**—*Ann. phytopath. Soc. Japan*, 16, 3–4, pp. 109–112, 6 figs., 1952. [Japanese, with English summary. Received March, 1953.]

Further studies on the peach anthracnose organism (*Gloeosporium laeticolor*) in Japan [*R.A.M.*, 31, p. 128] showed that the fungus passes into the twig through

the peduncle without causing fruit drop. Isolations from sections of affected twigs demonstrated that in late spring colonization was restricted to the area around the point of attachment of young, diseased fruits but by December the mycelium had invaded the entire twig. The fungus can also penetrate a young shoot, but as in nature these are generally too old to be infected by the time the conidia are disseminated, it is concluded that the young fruits afford the sole means of entry for the fungus.

Nyland (G.) & Brooks (R. M.). **Virus-free Cherry budwood of sweet Cherry varieties developed free from known viruses.**—*Calif. Agric.*, 7, 3, p. 8, 1953.

Virus-free budwood of a number of sweet cherry varieties has been propagated in experimental plantings at the University of California, Davis. Work is now in progress in Washington and Oregon to develop virus-free rootstocks which would thus permit the cultivation of completely virus-free trees [cf. *R.A.M.*, 30, p. 329].

Fulton (R. H.). **Effect of heat treatment on the type 2 virus present in the Robinson Strawberry.**—*Plant Dis. Reptr*, 36, 12, pp. 466–467, 1952. [Multilithed.]

In trials at the Department of Botany and Plant Pathology, Michigan State College, to determine whether strawberry type 2 virus [*R.A.M.*, 32, p. 323] could be eliminated from dormant Robinson strawberry plants by hot-water treatment [cf. ibid., 32, p. 262], the virus was not destroyed by temperatures up to 48° C., above which the plants were killed.

Mezzetti (A.). **Altre osservazioni sulla 'defogliazione del Kaki'.** [Further observations on leaf fall of Persimmon.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 75–78, 1952. [English summary.]

This paper on leaf fall of persimmons in Italy, probably due to a virus, has already been noticed from another source [*R.A.M.*, 29, p. 627].

Brian (P. W.). **Systemic fungicides.**—*Plant Prot. Overseas Rev.*, 3, 3, pp. 5–10, 1952.

The author briefly reviews the results of recent research on the use of systemic fungicides for the control of plant diseases [*R.A.M.*, 32, p. 27] and surveys the long-term prospects in this field.

Newton (W.). **Effects of the application of fungicides to wounded plant tissues.**—*Sci. Agric.*, 32, 12, pp. 659–662, 1952.

Tests were carried out at the Laboratory of Plant Pathology, Saanichton, British Columbia, to determine the effect of fungicidal dusts on wounded plant tissues [cf. *R.A.M.*, 28, p. 344]. Arasan and spergon dusts affected favourably potato setts planted in soil artificially infested with either *Fusarium caeruleum* [ibid., 10, p. 745] or an unidentified *F.* sp. from decayed setts. Infection by the former was 60 and the latter 2 per cent. with arasan, 48 and 16 with fermate, and 80 and 25, respectively, with spergon, against 92 and 80 per cent. for the control. Copper oxide dust increased infection by both species.

The number of rooted cuttings of cypress (*Cupressus lawsoniana*), tamarisk (*Tamarix parviflora*), *Sequoia washingtoniana*, and holly (*Ilex aquifolium*) out of groups of 50 were, respectively, 17, 45, 8, and 9 for arasan, 23, 21, 6, and 9 for spergon, and 8, 37, 14, and 8 for fermate compared with 8, 24, 1, and 5 for no treatment [cf. ibid., 32, p. 406]. None of the three fungicides interfered significantly with the natural healing of wounded tissues.

Landreth (J.). **A note on an improvement to pneumatic knapsack sprayers.**—*Tea Quart.*, 23, 3, p. 86, 1952.

The average nozzle output from pneumatic knapsack sprayers recommended by the Tea Research Institute, Ceylon, is 5 gals. per hour at 60 lb. pressure per sq. in. and 9 gals. at 160 lb. It has been found that a pressure-reducing valve fitted to the discharge outlet pipe and set at a predetermined pressure ensures a constant nozzle output, particularly from knapsacks operating at higher pressures, as the valve can be adjusted to the initial air pressure in the container.

Moreau (C.). **Les maladies parasitaires des principales cultures coloniales. Revue bibliographique. IX. X.** [The parasitic diseases of the principal colonial crops. Bibliographical review. IX. X.]—*Rev. Mycol.*, 17, *Suppl. colon.* 1, pp. 30–47; 2, pp. 84–96, 1952.

Further notes are given on the principal diseases of colonial crops [cf. *R.A.M.*, 31, p. 617], based on the literature (181 titles in all) published from 1948 to 1952.

Manton (I[sobel]), Clarke (B.), & Greenwood (A. D.). **Observations with the electron microscope on a species of Saprolegnia.**—*J. exp. Bot.*, 2, 6, pp. 321–331, 8 pl., 1951.

Electron micrographs taken in the Botany Department, University of Leeds, are presented showing the morphology of the flagella in each of the two motile phases of *Saprolegnia ferax* [see next abstract]. The anterior in both phases is a hairy flagellum (Flimmergeissel) with hairs 2 to 3 μ long in two rows, each ending in a thin hair-point. The axis is covered by a wide, transparent sheath which appears to liquefy after death. The hind flagellum, devoid of hairs, has a similar sheath, though there are indications that it is flattened into a fin. Some very fine hairs 0·5 μ long are interpreted as a possible internal framework to this fin. The axis of each flagellum is fibrillar. The cyst walls are covered with doubled headed hooks, strong enough to attach the cyst to passing objects.

Manton (I[sobel]), Clarke (B.), Greenwood (A. D.), & Flint (E. A.). **Further observations on the structure of plant cilia, by a combination of visual and electron microscopy.**—*J. exp. Bot.*, 3, 8, pp. 204–215, 11 pl., 1952.

Plates obtained in further work at the Botany Department, University of Leeds, by combining visual microscopy of stained material with electron microscopy are presented, demonstrating fibrillar disintegration in the flagella of *Saprolegnia ferax* [see preceding abstract], *Allomyces arbuscula*, and *Olpidium brassicae*.

In stained material of all the organisms seen under the electron microscope the axis of the anterior flagellum was separated into 11 strands, two of which were usually central and followed a more undulating course than the others, being more readily broken and evidently of a different physical texture. In the hind flagellum of *S. ferax* the axis dismembered less easily and it was not possible to see whether there was a separate central pair.

There was no conspicuous sheath to the flagellum of *O. brassicae*, but there is probably a skin, the characteristic flexure in certain partially decomposed specimens being induced, apparently, by shrinkage of the skin. The whiplash point is conspicuous, and in the unstained condition a slight terminal swelling on the end may be characteristic. Low-power views of stained material show clearly the compound bulbous base marking the attachment of the flagellum to the inside of the body. No interpretable internal organs other than the base remained. There was a smoke-like prolongation beyond the apparent ends of the strands, corresponding, perhaps, to the region of the whiplash. If so, the whiplash would consist of the

same 11 strands as the rest of the flagellum, but these would be in a more destructible condition.

The structure of the anterior flagellum points to an affinity with the brown and yellow-green algae and the flagellates.

GOLDIE-SMITH (E. KATHLEEN). **The sporangial phase of Pythium undulatum Petersen.**—*J. Elisha Mitchell sci. Soc.*, 68, 2, pp. 273–292, 3 pl., 2 figs., 1952.

This is a detailed study of the morphology and life history of *Pythium undulatum* [*R.A.M.*, 29, p. 523]. The premature discoloration of water-lily (*Nymphaea* spp.) leaves attributed by Drechsler to attacks by the fungus [ibid., 20, p. 597] was not reproduced in inoculation experiments at Royal Holloway College, University of London. A darkening of the leaf around an inoculum of another *Pythium* sp. from the same source occurred, however, in 24 hours or less. It is suggested that *P. undulatum*, if parasitic on water-lilies, must be only very mildly so.

PONTECORVO (G.), ROPER (J. A.), & FORBES (E.). **Genetic recombination without sexual reproduction in Aspergillus niger.**—*J. gen. Microbiol.*, 8, 1, pp. 198–210, 1 pl., 1953.

In the Department of Genetics, Glasgow University, Roper's technique for the production in filamentous fungi of strains with heterozygous diploid nuclei in their hyphae [*Experientia*, 8, p. 14, 1952] was applied successfully to *Aspergillus niger* [*R.A.M.*, 31, p. 567]. The diploids, heterozygous for known markers, produce new strains, mostly still diploid and homozygous for some or all of the markers, therefore associating or recombining in all possible ways the properties of the two strains from which the diploid was formed.

These results definitely indicate that deliberate 'breeding' of strains has become a practical proposition in industrial fermentations based on these fungi.

KELLY (C. D.) & PADY (S. M.). **Microbiological studies of air over some nonarctic regions of Canada.**—*Canad. J. Bot.*, 31, 1, pp. 90–106, 2 graphs, 2 maps, 1953.

During 1948 and 1949 estimates were made of the numbers of bacteria and fungi in the air on ten separate flights between Goose Bay, Labrador, and Fairbanks, Alaska, using agar plates, silicone-coated slides in the McGill General Electric sampler [see next abstract], and glass wool filters. The results were correlated with definite air masses. The sampler gave higher and more consistent numbers for the total viable count than the filters, while the slides gave the total fungus count including non-viable spores and those that did not grow on the agar plates. The average number of bacteria and fungi found varied with the air mass and time of year. The highest fungus count was 23·6 per cu. ft. in continental polar air during the summer, and the lowest 0·01. The highest bacterial count, obtained in Pacific polar air during spring and autumn, was 5·6 and the lowest 0·2 per cu. ft. By far the most common fungi were *Cladosporium* and smuts [*Ustilago*].

PADY (S. M.) & KELLY (C. D.). **Studies on microorganisms in Arctic air during 1949 and 1950.**—*Canad. J. Bot.*, 31, 1, pp. 107–122, 2 diags., 4 graphs, 1953.

The numbers of bacteria in arctic air were determined by daily sampling at Churchill, Manitoba, during July and August, 1950, and in one flight to and from Baker Lake already reported [*R.A.M.*, 31, p. 566], in July, 1949, and two to and from Resolute Bay, North West Territories in August, 1950. Of three samplers used simultaneously the General Electric sampler [loc. cit. and preceding abstract] gave slightly higher readings than the Bourdillon Slit Sampler [*J. Hyg., Camb.*, 41, pp. 197–224, 1941] while the filter gave low readings throughout. Daily averages of bacteria 55 ft. above ground ranged from 0·9 to 30·1 per cu. ft. and in the flight to

Resolute Bay from 0·3 to 0·9 per cu. ft. Comparable readings of fungi were 0·5 to 4·4 and 0·01 to 0·7 per cu. ft. with the slit sampler. Silicone slides yielded up to 115 per cu. ft. including a high proportion of non-viable fungus spores. Most of the organisms were soil inhabitants but there were some fungus parasites, chiefly smut (*Ustilago*) spores [*R.A.M.*, 31, p. 28]. It appears that south winds carry large numbers of organisms northwards, many of which are no longer viable when they reach the arctic, while north winds from the Pole contain very low numbers even in summer.

Fellows (H.) & Connin (R. V.). **A glass and plastic insect-proof cage.**—*Plant Dis. Reptr*, 36, 12, pp. 471–473, 3 figs., 1952. [Multilithed.]

A description is given of a plastic-covered, cylindrical, Pyrex glass insect-proof cage, 8 in. in diameter and 12 in. high, for use in virus transmission experiments with potted plants. The cages stand on a special plywood bench, being sealed into plywood collars. Small holes in the plywood base provide for aeration and a larger one accommodates the pot base. Watering is done through a tube which passes up through the hole in the pot base to a point slightly above the soil surface. All joints are made insect proof. The cage has been used successfully at the Kansas Agricultural Experiment Station. Auxiliary chambers for starting a number of small plants are also described.

Webley (D. M.). **A simple method for producing microcultures in hanging drops with special reference to organisms utilizing oils.**—*J. gen. Microbiol.*, 8, 1, pp. 66–71, 1 pl., 2 diags., 1953.

At the Macaulay Institute for Soil Research, Craigiebuckler, Aberdeen, the following simple, aseptic method for observing the behaviour and development of a few cells in hanging drops was devised for workers with limited facilities for such purposes. A suspension of the organism is introduced into an all-glass spray projecting through the neck of a porcelain lampshade standing on the edge of the bench, so that the squeeze bulb of the spray hangs downwards through a hole in the rim. A glass cylinder, lined with moist filter paper covers the upper part of the lampshade and is sealed to it with putty. It is surmounted by a round glass plate with a central hole $\frac{1}{4}$ in. in diameter directly above the top of the spray. A glass ring surrounds the hole and supports a sterile, silicone-treated cover-slip. The plate and ring are sealed with liquid paraffin. The required number of cells is obtained by adjusting the density of the suspension.

Stanton (W. R.). **A simple chamber for use in aseptic microdissection.**—*J. gen. Microbiol.*, 7, 3–4, pp. 243–244, 1 pl., 1 diag., 1952.

A simple aseptic chamber, initially sterilized by spraying with 0·1 per cent. thymol in ethanol, composed of a $\frac{3}{16}$ in. convex perspex casing for a binocular microscope, and sealed to a plate glass base with sponge rubber strips was designed at the John Innes Horticultural Institution, Bayfordbury, Herts., for microdissection under sterile conditions. There are perspex doors at each side for the arms and an eyepiece aperture, designed so that the microscope can be used with or without a foot and in an inclined or vertical position. The eyepiece aperture is closed with sheet polythene with tubes surrounding the eyepieces and fixed to them with rubber bands. Humidity is maintained by a cylinder of filter paper in a dish of water. Uncovered agar plates remain uncontaminated even after the chamber has been in use.

Jefferys (E. G.). **The stability of antibiotics in soils.**—*J. gen. Microbiol.*, 7, 3–4, pp. 295–312, 19 histograms, 1952.

The results of studies at the Butterwick Research Laboratories, Welwyn, Herts.,

on the inactivation of ten antibiotics, eight of them metabolic products of fungi isolated from soils of the Bagshot Sand type from Wareham Heath, Dorset, in this soil and a neutral garden loam [cf. *R.A.M.*, 32, p. 393] showed it to occur as the result of (*a*) intrinsic instability at the soil pH (e.g. albidin, frequentin, gliotoxin, penicillin, and viridin), (*b*) microbiological activity (griseofulvin, mycophenolic acid, and patulin), greatest in soils with high organic matter, (*c*) adsorption on a soil constituent (streptomycin), and (*d*) an undetermined form of inactivation, probably chemical in nature (gladiolic acid, penicillin, and streptomycin). It is concluded that all the antibiotics are sufficiently stable, in some soils at least, to have a significant biological effect.

Stevenson (I. L.) & Lochhead (A. G.). **The use of a percolation technique in studying antibiotic production in soil.**—*Canad. J. Bot.*, 31, 1, pp. 23–27, 1 pl., 3 graphs, 1953.

It has been suggested that the rapid increase in soil microflora brought about by the addition of fresh organic matter might create conditions unfavourable to soil pathogens through competition for existing nutrients or by an increase in the proportion of organisms antagonistic to them. At the Division of Bacteriology and Dairy Research, Department of Agriculture, Ottawa, the percolation technique described by Lees and Quastrel (*Biochem. J.*, 40, pp. 803–815, 1946) was adapted to the study of antibiotic production in soil [see preceding abstract]. The method consisted in the automatic, intermittent perfusion of a solution through a column of soil using an Audus-type pyrex percolator. Periodically assays of 0·3 ml. of the perfusing solution were made for the presence of antibiotic substances without disturbing the soil sample itself. Results are given of the production of clavacin by *Penicillium* sp. BDR 560 and an unidentified antibiotic from two *Streptomyces* species. Following inoculation of sterile compost plus 2·5 per cent. glucose with a spore suspension, claviformin production reached a peak in eight to nine days and was equivalent to that in Czapek-Dox solution. The peaks for the *S.* spp. were at four and nine days, respectively.

The advantages of this method over those generally used are that it gives a much clearer picture of the actual course of antibiotic production, the water content of the soil remains constant, and maximum aeration is effected. It is limited to the study of antagonists producing neutral or acidic antibiotics as basic ones, such as streptomycin, are lost from the soil solution by rapid adsorption, often with a high degree of irreversibility, on the soil colloids.

Gopalkrishnan (K. S.) & Jump (J. A.). **The activity of thiolutin against certain fungi and seed-borne diseases.**—*Proc. Ind. Acad. Sci.*, 61 (*1951*), pp. 97–102, 3 graphs, 1952.

Studies were carried out at the University of Notre Dame, Indiana, to determine the inhibitory activity of thiolutin [*R.A.M.*, 32, p. 154] against certain fungi *in vitro* and its value as a seed protectant. All the fungi tested were inhibited, *Pythium debaryanum*, *Sphaeropsis ulmicola* [ibid., 27, p. 503], and *Sclerotinia fructicola* at a concentration of 10 p.p.m., *Colletotrichum* [*Glomerella*] *gossypii*, *Phomopsis* [*Diaporthe*] *citri*, and *Rhizoctonia* [*Corticium*] *solani* at 50 to 100 p.p.m., while *Alternaria solani*, *Fusarium* [*bulbigenum* var.] *lycopersici*, and *Helminthosporium sativum* grew even at 100 p.p.m., though growth was delayed. In phytotoxicity trials no foliar injury was noted on young tomato plants sprayed with suspensions and solutions of thiolutin (up to 200 p.p.m.). Roots of young maize, pea, tomato, and sunflower plants immersed for a week in thiolutin (up to 100 p.p.m.) showed no root injury though some stunting occurred at 100 p.p.m. Soaking maize, pea, and radish seeds in thiolutin for eight hours only slightly inhibited germination. Actidione, used in comparison was definitely inhibitory, especially to radish.

Soaking or dusting oat grain infected with *H. sativum* with concentrations of up to 1 per cent. thiolutin (dust being best) increased germination from 88 (control) to 96 per cent. and decreased disease incidence from 53 (control) to 3 per cent., the corresponding figures for spergon being 95 and 32 per cent. Similarly, dusting cotton seeds with ½ to 2 per cent. thiolutin resulted in a reduction of *G. gossypii* [ibid., 32, p. 312] from 65 (control) to 32 to 46 per cent. compared with 30 for spergon and 6 per cent. for new improved ceresan.

Smit (J.) & Wieringa (K. T.). **Microbiological decomposition of litter.**—*Nature, Lond.*, 171, 4357, pp. 794–795, 1 fig., 1953.

At the Agricultural University, Wageningen, Holland, hanging, yellowed, and newly fallen leaves of various trees, including *Forsythia*, *Amelanchier*, oak, beech, apple, and peach, were shaken in sterile tap water and plated on malt agar. White colonies of *Pullularia pullulans* [*R.A.M.*, 22, p. 405] were obtained, together with several coloured varieties which differed in the rate of pigment production (brown-red to black). This organism also appeared almost exclusively when leaf suspensions were plated on pectin agar. When freshly collected leaves were kept between two sterile sheets of filter paper moistened with sterile water the numbers of *P. pullulans* increased to many hundred in two days in contrast to other organisms which did not. It appears, therefore, that the overwhelming majority of the micro-population of dead leaves of many trees consists of *P. pullulans* and that this organism is the first to develop under conditions similar to those in newly fallen litter, and decomposes the pectic materials. Later, in a more advanced stage of decomposition, it tends to give way to others.

Pullularia also predominated among the pectin-splitting organisms in small green leaves in early spring and in those in bud. From the results of a quantitative experiment it was estimated that fresh *Amelanchier* leaves bear 3,000 colonies per gm. leaf and when the leaves were kept for three days between moist filter paper the number rose to 287,000 per gm.

Richardson (L. R.) & Halick (J. V.). **Moisture in molasses as a factor in the heating of feeds.**—*Bull. Tex. agric. Exp. Sta.* 754, 16 pp., 3 graphs, 1952. [Received February, 1953.]

A study is reported of the conditions in which [unspecified] moulds develop in feeds containing molasses.

Harley (J. L.), McCready (C. C.), & Brierley (J. K.). **The uptake of phosphate by excised mycorrhizal roots of the Beech. IV. The effect of oxygen concentration upon host and fungus.**—*New Phytol.*, 52, 2, pp. 124–132, 1 diag., 9 graphs, 1953.

In further studies in this series [cf. *R.A.M.*, 32, p. 142] phosphorus and oxygen uptake by excised beech mycorrhiza rose with oxygen concentrations from nitrogen to air and appeared proportional to one another at low oxygen concentrations. Observations on intact mycorrhiza, separated fungal sheaths, and host cores revealed that absorption by the sheath was sensitive to oxygen concentration over the whole range whereas that of the core was unaffected between 21 and 1 per cent. oxygen.

Mishustin (E. N.). Микрофлора почвы и образование микоризы у Дуба. [The soil microflora and the formation of mycorrhiza in Oak.]—Агробиология [*Agrobiology, Moscow*], *1951*, 2, pp. 27–39, 1951. [Received April, 1953.]

Studies at the Institute of Microbiology, U.S.S.R. Academy of Sciences, on the soil microflora and its effect on plant development have shown that enriching oak

sowings in steppe and forest-steppe regions of the European part of the U.S.S.R. with mycorrhized soil and granulated superphosphate (7 gm. per hole) had a beneficial effect on young seedlings. They were more vigorous and developed more mycorrhiza [*R.A.M.*, 30, p. 282]. Other conditions conducive to mycorrhiza formation in oak include the addition of micro-organisms of the rhizosphere, preferably pure cultures of the fungi forming the mycorrhiza; the provision of mineral and organic matter; and the maintenance of soil moisture and control of weeds.

Sirén (G.) & Bergman (F.). **Svamparna och våra skogsträd.** [Fungi and our forest trees.]—*Skogsbruket, Helsingfors*, 21, 2, pp. 39–43, 1951. [Abs. in *For. Abstr.*, 14, 2, p. 148, 1953.]

Mycorrhiza in a 112-year-old stand of aspen and spruce [in Finland: *R.A.M.*, 22, p. 104; 28, p. 189] decreased steadily as the depth below ground-level increased but were found to a depth of 125 cm. Where aspen roots grew through decayed birch roots of an earlier forest they were closer morphologically to roots of the humus layer than to those of the mineral soil layers.

Roots of both aspen and spruce were inoculated successfully with cultures of *Gyromitra esculenta*: mycelia of this species were isolated from aspen mycorrhiza. Hitherto the ascomycetes have been considered unable to form mycorrhiza with tree roots.

Barer (R.), Ross (K. F. A.), & Tkaczyk (S.). **Refractometry of living cells.**—*Nature, Lond.*, 171, 4356, pp. 720–724, 1953.

Studies in the Department of Human Anatomy, Oxford, on the application of microrefractometry to living cells included the fungus mycelium. The measurement of the refractive index in plasma albumin by phase-contrast microscopy, indicated that the solid content of hyphae varies along their length. Consequently only measurements of the young, actively growing tips were used as a basis for comparison of nearly 20 species of *Penicillium*, which revealed that the solid content of the active regions was remarkably constant, the extreme values being 24 to 28 per cent., compared with about 15 per cent. in *Rhizopus* and *Absidia*. Such differences may have some taxonomic significance.

At certain concentrations of protein in the external medium some fungal spores appeared bright while others in the same group were dark, in positive phase contrast. The former invariably germinated, producing a bright mycelium, but dark spores remained dormant or, if they germinated, consistently passed through a stage of reversal of contrast. In *A. glauca* the two progametangia coming into contact from different hyphae had different refractive indices. Both brewer's and baker's yeasts [*Saccharomyces cerevisiae*] contained an exceptional amount of solids (40 per cent.) in the cytoplasm of resting cells.

Plunkett (B. E.). **Nutritional and other aspects of fruit-body production in pure cultures of Collybia velutipes (Curt.) Fr.**—*Ann. Bot., Lond.*, N.S., 17, 66, pp. 193–217, 2 pl., 7 graphs, 1953.

In studies at Birkbeck College, London, a synthetic medium plus asparagine, sucrose, and vitamin B_1 favoured fructification by *Collybia velutipes* [*R.A.M.*, 28, p. 478] rather than mycelial growth. Primordia appeared between pH 5·2 and 7·2 approximately. Relatively low initial concentration of asparagine, high initial sucrose, and increases in volume (without essential increase of the air interface) of media increased the dry weights of sporophore crops. In comparison with wild sporophores those produced in pure culture were smaller and had rather longer stipes in relation to the cap diameter, and the dark brown base of the stipe, very conspicuous in nature, was less marked.

Berk (S.). **Biological effects of ionizing radiations from radium and polonium on certain fungi.**—*Mycologia*, 44, 5, pp. 587–598, 2 figs., 1952.

In studies at the Pitman-Dunn Laboratories, Frankford Arsenal, Philadelphia, constant irradiation with a 7·5 μgm. source of radium inhibited growth and sporulation of *Chaetomium globosum*, *Lenzites trabea*, *Aspergillus niger*, *A. flavus*, and a species of *Penicillium* growing on potato dextrose agar plates. A strong polonium source inhibited the vegetative growth and sporulation of *A. niger*.

Goidànich (G.) & Camici (Leontina). **Ricerche sulla fisiologia della cicatrizzazione. Influenza dei microrganismi sull' andamento delle rigenerazioni riparative.** [Researches on the physiology of wound healing. The influence of micro-organisms on the progress of the reparative regeneration processes.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 3–10, 3 figs., 1952. [English summary.]

When agar cubes containing *Penicillium* conidia which had been incubated for 24 hours at 25° C. or a culture filtrate of the fungus were placed on the freshly cut surfaces of potato tubers [cf. *R.A.M.*, 27, p. 152] a deepening of the wound periderm took place under the cubes; the periderm was, however, of uniform thickness when the cubes contained freshly-sown conidia or those with culture filtrates were applied 24 hours after the tuber had been cut. A layer of cells, the walls of which were lined with fatty materials, developed during the initial stage of the healing process and appeared to serve as a barrier against the penetration of the metabolic products of the fungus. The paper concludes with some general considerations on wound healing processes in plants.

Gallay (R.) & Münster (J.). **Les efforts entrepris pour améliorer la qualité des plants indigènes de Pommes de terre. Les résultats obtenus.** [The efforts made to improve the quality of indigenous Potato plants. The results obtained.]—*Rev. rom. Agric.*, 7, 12, pp. 91–93, 4 figs., 1951.

In Switzerland the regulations governing seed-potato certification [*R.A.M.*, 27, p. 437; 30, pp. 65, 262] require that all crops for certification shall be officially inspected at least twice (three times for class A certificate). Each planting must be of a certain minimum size and at least 6 m. (for class B) distant from any other potato crop, and for class A 50 m. The number of plants affected by virus disease [see next abstract] in class A must not exceed one per are [100 sq. m.] and in B four (eight at the first inspection). Five or six roguings are often carried out in early summer. Pulling up the haulms on a date officially specified is obligatory for an A certificate. Potatoes grown in certain specified localities where the conditions favour the spread of virus diseases are not accepted for certification. Seed potatoes are submitted to tuber-indexing in winter. Finally, 100 tubers of each lot sold must be sent to the local Federal Station, where they are grown and inspected. If the crop is not up to the required standard the grower may lose his membership of the seed-growers association.

As a result of the measures adopted the yield of Swiss-grown seed potatoes (five varieties) granted certificate A averaged for the period 1949–51, 282·7 kg. per are, as against 270 kg. for the same varieties imported.

Münster (J.) & Murbach (R.). **L'application d'insecticides contre les pucerons vecteurs des viroses de la Pomme de terre peut-elle garantir la production de plants de qualité?** [Can the application of insecticides against the aphid vectors of Potato viroses guarantee the production of quality plants?]—*Rev. rom. Agric.*, 8, 6, pp. 41–43, 2 graphs, 1952.

In an experiment carried out near Lausanne, Switzerland, class A Bintje potatoes

(no plant showing serious virus attack after three inspections [see preceding abstract]) were sprayed with 0·2 per cent. pestox 3H [cf. *R.A.M.*, 31, pp. 159, 170] (A) every 14 days, i.e., on 5th and 18th June, 3rd and 17th July, and 1st August, (B) every 21 days, i.e., on 5th and 27th June, and 17th July, (C) every 28 days, i.e., on 5th June, 3rd July, and 1st August. At harvest on 20th September, on one-half of each plot, where the haulms had been pulled on 1st August, A, B, and C gave respectively, 7, 7, and 4 per cent. virus disease (mild mosaic [? virus X], severe mosaic [virus Y], and leaf roll), compared with 9 per cent. for the unsprayed. Where the haulms were not removed the corresponding figures were 14, 15, 14, and 9.

Spraying definitely reduced the aphid population over the period as a whole; it was smallest in the plots sprayed most frequently, though the differences between the sprayed and unsprayed plots did not become important until the end of June. By mid-July, when the colonies were at a maximum, aphids were reduced by over 90 per cent., but apparently spraying did not prevent infestation by winged aphids [cf. ibid., 32, p. 302] or the development of apterous colonies during the first 20 days of June, a period specially critical for the transmission of virus diseases. Further, the insects on the sprayed plants moved about more than those on the unsprayed and therefore the punctures on the former must have been more numerous.

It is concluded that in areas heavily infested by aphid vectors of potato virus diseases and where the insects appear early in the season, about a fortnight after emergence, degeneration is unlikely to be prevented by the application of systemic insecticides, unless spraying is effected more often during June or the concentration of the insecticide increased. In these circumstances growers are not advised to apply systemic insecticides for the production of high quality potatoes.

Bradley (R. H. E.) & Ganong (R. Y.). **Note on the time Potato leaf roll virus takes to pass from aphids on the leaves into the developing tubers.**—*Canad. J. Bot.*, 31, 1, pp. 143–144, 1953.

In 1949 ten rows of Foundation A Katahdin potato tubers were planted in the field at Woodstock, New Brunswick, while 30 tubers from the same source were halved and planted under insect-proof cages. After the commencement of tuber formation 50 to 100 *Myzus persicae* reared on Green Mountain plants affected by leaf roll [*R.A.M.*, 32, pp. 143, 334] were placed on each plant in one of the outside rows and under 15 cages. After five days the plots and cages were fumigated. Three days later and ever four days thereafter one tuber was taken from each infested plant, and from an equal number of uninfested plants. They were planted in the field the following year. The same procedure was observed in 1950 except that samples were also taken five days after infestation.

In both years the percentage of tubers infected remained constant after 20 days from infestation. In 1949 half the tubers had become infected in eight days and all from field plants after 16 days, while those from caged plants were not 100 per cent. infected until 24 days after infestation. In 1950, 30 tubers from plants five days after infestation produced healthy plants, otherwise the results were similar to those obtained in 1949. Even when tubers were removed soon after becoming infected in 1950 nearly all the eyes produced leaf roll plants.

Muncie (J. H.). **Comparison of certain standard and experimental fungicides in Potato late blight control.**—*Amer. Potato J.*, 29, 8, pp. 186–191, 1952.

In comparative plot tests carried out during 1951 at the Experiment Station, Lake City, Michigan, against blight [*Phytophthora infestans*: *R.A.M.*, 32, p. 335], Chippewa potatoes were sprayed on nine occasions between 29th June and 28th August with 14 experimental organic and inorganic and standard fungicides.

DDT was added to the fungicide at each application and all plots were sprayed once for aphid control.

Under the experimental conditions outstanding yields of U.S. number 1 grade potatoes were obtained following the organic material F 1003 (a zinc formulation of Dow Chemical Co.) with 344·8 bush. per acre, manganese ethylene bisdithiocarbamate 330·7, orthocide 406 323·5, cop-o-zinc 315·8, and parzate powder 307·2, compared with 209·9 for those sprayed with DDT only. In general, all the materials tested greatly reduced foliage infection. The plots sprayed with manganese ethylene bisdithiocarbamate, 1189 and 1124 (both organic materials from General Chemical Co.), F 1003, orthocide 406, and Bordeaux mixture had the least tuber rot (0·4 to 1·9 per cent.), tribasic and fungicide C (1189 plus a fixed copper) also giving a low percentage, but some of these materials allowed a rather high foliage infection (up to 71 per cent., compared with 91·2 on the control), whereas with parzate, 1217 slurry (Carbide and Carbon Chemical Co.), and dithane the reverse obtained.

Trials were also made in growers' fields in four counties. In three counties where blight was either absent or appeared so late that infection was negligible cop-o-zinc and orthocide 406 gave higher average yields than tribasic copper sulphate in two of them but in Houghton county the reverse was true. The highest yield in Menominee county, where blight progressed rapidly, was obtained with dithane D-14 plus zinc sulphate; cop-o-zinc, orthocide 406, and Bordeaux all proved superior to tribasic. In Kalkaska county plots sprayed with dry parzate had much less early blight [*Alternaria solani*] infection than those sprayed with orthocide 406 or cop-o-zinc, though yields were less.

Müller (K. O.) & Haigh (J. C.). **Nature of 'field resistance' of the Potato to Phytophthora infestans De Bary.**—*Nature, Lond.*, 171, 4357, pp. 781–783, 1 graph, 1953.

A working hypothesis is put forward in an attempt to explain the fact that in Europe blight (*Phytophthora infestans*) does not reach epidemic proportions before the flowering time of the potato, which indicates a relation between the rhythm of development of host and parasite. Because this disease is airborne and originates each year from small primary foci, it appears that about five generations of the parasite are necessary to infect a large plot from a few such foci. The degree of infestation of the plot, C_{ep}, supposing spread within it to be homogeneous and increasing in geometrical progression, is taken to be $(c.\ P_I)^n$, where c is the intensity of fructification per single leaf spot, P_I the probability of becoming infected per unit area of leaf, and n the number of generations since initial infection. This formula illustrates, with certain reservations and assumptions, the principle on which the working hypothesis is based.

The hypothesis was tested by inoculating fresh pieces of potato leaf of the same size with an atomized, weak zoospore suspension of the A strain of *P. infestans* [*R.A.M.*, 32, p. 206], the results (number of pieces attacked in five days) being used to give a statistical value R_I to P_I. A preliminary experiment on these lines showed that field grown plants of Champion and Stormont Dawn were significantly less infected than Home Guard or King Edward.

In the main tests, carried out at the National Institute of Agricultural Botany, Cambridge, in 1951, 12 varieties ranging from first earlies to late main crop were tested by the leaf-piece method from the end of June to the middle of September, the results being compared with reaction in the field. There was a definite correlation between 'the probability of becoming infected per unit of foliage' (R_I) and field behaviour; the later and more slowly blight appeared and increased to epidemic proportions the smaller were the R_I values. The early varieties were resistant and the late susceptible, the early variety Champion being an outstanding blight-resister. Late incidence is not due to a lowering of resistance with increasing

age of plant or leaf, in fact there are indications that an ageing leaf becomes less susceptible, but is largely a consequence of differences in P_I, which in turn is dependent on environmental factors but independent of the fungus strain used.

During the tests it was noticed that when spore suspensions were sprayed on to the lower leaf surface no significant varietal differences could be detected, so that natural infection probably takes place on the upper surface. Since the strain of fungus does not affect P_I the factors governing this reaction must be different from those which confer resistance due to suprasensitivity. For high resistance breeding should combine varieties of low P_I with ones possessing 'true resistance' by virtue of suprasensitivity.

Some experiments on the control of potash deficiency in Potatoes.—*J. Dep. Agric. Eire*, 48, pp. 68–80, 1951–52. [Received May, 1953.]

From 1947 to 1949 experiments were conducted at four centres in Eire to ascertain the effect of applying a potassium-copper sulphate spray for the simultaneous control of blight [*Phytophthora infestans*] and potassium deficiency [cf. *R.A.M.*, 26, p. 78; 30, p. 120]. The materials used were: A (Burgundy mixture); B (20 lb. copper sulphate and 15 lb. potassium carbonate per 100 gals.); and C (Burgundy plus 11 lb. potassium sulphate per 100 gals.). Approximately 120 gals. of mixture were applied per acre in each treatment. The only soil fertilizer applied was 8 cwt. of superphosphate and 4 cwt. of ammonium sulphate per acre. Spray B was effective against blight and five applications greatly reduced the severity of the potassium deficiency symptoms, but the total yields compared very unfavourably with those from plots receiving full soil fertilizer treatment. Three applications of C also reduced deficiency symptoms. In preliminary tests in 1951 early top-dressing with a potassium fertilizer (3 cwt. per acre) controlled the deficiency and substantially increased yield.

Terman (G. L.), Plummer (B. E.), & Folsom (D.). **Some effects of arsenical vine killers on Potatoes and Oats.**—*Bull. Me agric. Exp. Sta.* 501, 11 pp., 3 figs., 1952. [Received February, 1953.]

Studies in Maine from 1947 to 1951 indicated that arsenic residues accruing in the soil from normal applications of potato haulm killers are unlikely to become toxic to the growth of subsequent potato and oat crops.

Gretchushnikov (A. I.). Токсины гриба **Synchytrium endobioticum (Schilb.) Percival**—возбудителя рака Картофеля. [Toxins of the fungus *Synchytrium endobioticum* (Schilb.) Percival—the causal agent of Potato wart.]—Труд. Инст. Физиол. Раст. Тимирязева [*Trans. Timiryazev Inst. Plant Physiol.*], 6, 2, pp. 97–108, 1949. [Received May, 1953.]

Investigations on the toxins from potato warts (*Synchytrium endobioticum*) [*R.A.M.*, 32, p. 336 and next abstract] at the Scientific Research Institute for Potato Cultivation, U.S.S.R., included studies on the influence of these toxins (water and alcohol extracts) on root growth from tomato and potato shoots, changes in physiological processes of infected potato tubers (respiration, peroxidase, amylase, lipase, and protease activity) and their glucose and amino acid content. Under the influence of the toxins the enzymes which accelerate the mobilization of reserves and promote cell growth (formation of warts) are released from the protoplasm. The basic protoplasmic matter becomes more mobile, starch is changed to sugar, and proteins to amino acids. Conditions conducive to the development of the fungus and abnormal development of the cells of affected plants ensue. The growth of the cells is accompanied by increased respiration which, together with

the growth processes, uses up the plasmic matter and the cells of the wart tissue ultimately die.

Kleinerman (Z. R.). О применении едких щелочей для дезинфекции почвы от рака Картофеля. [Application of caustic alkali for soil sterilization against Potato wart.]—Сад и Огород [*Orchard & Garden*], *1953*, 1, pp. 72–75, 1953.

In studies at the Minsk Scientific Research Station, U.S.S.R., on the control of potato wart disease [*Synchytrium endobioticum*: see preceding abstract] potassium and sodium hydroxide were found to be toxic to winter sporangia of the organism and were effective in sterilizing the soil at a concentration of 750 gm. per sq. m. in a 5 per cent. solution. Since the poisonous effect of these chemicals on human beings and animals is small and their sterilizing activity high, they appear as very promising fungicides to be used in mass applications against potato wart. The effect on potatoes, however, is as a rule oppressive. In trials cucumber, tomato, carrot, cabbage, pea, and sunflower developed normally while onions did not emerge at all.

Bhargava (K. S.) & Kishore (H.). **Occurrence of Verticillium in Potato tubers in India.**—*Nature, Lond.*, 171, 4357, pp. 800–801, 1953.

One of several diseased potato tubers collected in September, 1952, in the Bhowali-Naini Tal area, India, yielded a *Fusarium* and a *Verticillium* closely resembling *V. albo-atrum* [cf. *R.A.M.*, 30, p. 260]. This is the first record of *Verticillium* attacking potatoes in India.

Hellmers (E.) & Dowson (W. J.). **Further investigations of Potato black leg.**—*Acta Agric. scand.*, 3, 1, pp. 103–112, 4 figs., 1953.

In experiments carried out in 1952 at the Botany School, University of Cambridge, typical potato black leg symptoms [*R.A.M.*, 31, p. 321] were produced by seven separate strains of soft rot and black leg bacteria, including isolates from potato tubers from Denmark (*Erwinia atroseptica* and *E. carotovora*), from potato stems (*E. phytophthora* from England and *E. atroseptica* from Scotland and America), *E. carotovora* from an iris seed pod from America, and *E. aroideae* from a tobacco stem from Africa, when they were inoculated directly into the vascular bundles of young plants. Similar results were obtained with tomato and tobacco plants. Inoculations which did not pierce the vascular tissue did not usually initiate infection. Since the above strains all produced similar pathogenic effects they cannot be considered as distinct species, either on the grounds of pathogenicity or on a few biochemical differences, but should be regarded as varieties or strains of *E. carotovora*.

Bugnicourt (F.). **Une espèce fusarienne nouvelle, parasite du Riz.** [A new *Fusarium* species parasitic on Rice.]—*Rev. gén. Bot.*, 59, 695, pp. 13–18, 1 pl. (facing p. 64), 1 fig., 1952.

In 1949 and 1950 rice grains growing in dry culture near Canala on the east coast of New Caledonia and those of the variety 'Gundul tembaga' grown with or without irrigation near Merauke, Dutch New Guinea, were affected by a *Fusarium* [cf. *R.A.M.*, 31, p. 422] designated *F. annulatum* n.sp. [see next abstract] on account of the macroconidia, which were either extremely falciform, menisciform, or annular, 3- to 6-septate, and measuring 13 to 58 by 1·9 to 3·3 μ. The single or catenulate, uni- or bicellular, cylindrical to clavate microconidia measured 4·7 to 14·4 by 1·7 to 2·3 μ. No chlamydospores were seen. In culture the stroma was salmon pink to dark purple. In inoculation experiments the fungus was pathogenic only to the radicles and adventitious roots of seedling rice plants.

Bugnicourt (F.). **Note sur la mycoflore des semences de Riz dans les Territoires du Pacifique Sud.** [Note on the mycoflora of Rice seed in the Territories of the South Pacific.]—*Rev. Mycol.*, 17, *Suppl. colon.* 1, pp. 26–29, 1952.

On rice seed from the Fiji Islands, New Caledonia, Dutch New Guinea, Australian New Guinea, Tahiti, the Hawaiian Islands, and Australia [cf. *R.A.M.*, 31, p. 628] 20 different species of fungi were detected; the geographical distribution in the area concerned is tabulated. The fungi identified included *Fusarium annulatum* [see preceding abstract], two probably new species of *Helminthosporium*, and the following, not before recorded on rice: *Curvularia affinis*, *F. decemcellulare* [ibid., 25, p. 548; 31, p. 375], *F. kuhnii*, *F. moniliforme* var. *minus* [ibid., 10, p. 626], and *F. scirpi* var. *caudatum* [ibid., 25, p. 418].

Baba (I.), Takahashi (Y.), & Iwata (I.). **Studies on the nutrition of Rice with reference to Helminthosporium disease (preliminary report). I. The susceptibility of Rice as influenced by the aeration and the kinds of nutrient elements supplied.**—*Proc. Crop Sci. Soc. Japan*, 20, 1–2, pp. 163–166, 1951. [Japanese, with English summary. Received June, 1953.]

The results are presented of solution culture experiments carried out during 1948 and 1949 at Konosu farm attached to the National Agricultural Experiment Station, Japan, to study the growth and susceptibility of rice to *Helminthosporium* disease [*Ophiobolus miyabeanus*: *R.A.M.*, 32, p. 276 and next annotation].

Baba (I.), Takahashi (Y.), & Iwata (I.). **Studies on the nutrition of Rice with reference to Helminthosporium disease (preliminary report). II. The nutrients absorption of Rice as affected by the hydrogen sulphide added to culture solution.**—*Proc. Crop Sci. Soc. Japan*, 21, 1–2, pp. 98–99, 1952. [Japanese, with English summary. Received May, 1953.]

Further studies at the National Institute of Agricultural Sciences, Japan, indicated that the increased susceptibility of rice to *Helminthosporium* disease [*Ophiobolus miyabeanus*: see preceding annotation] following the addition of hydrogen sulphide to the culture solution was due mainly to the retarded absorption of nutrients, particularly potassium, silica, and manganese.

Chevaugeon (J.). **Ophiobolus oryzinus Sacc. Pourriture brune du pied du Riz. Maladie de l'Arkansas.** [*Ophiobolus oryzinus* Sacc. Brown foot rot of Rice. Arkansas disease.]—*Rev. Mycol.*, 17, *Suppl. colon.* 2, Fiche 7, 4 pp., 8 figs., 1952.

Brief notes are given on the salient features of *Ophiobolus oryzinus* [*R.A.M.*, 30, p. 341] and the disease it causes.

Jodon (N. E.). **Louisiana releases Sunbonnet through Seed Growers' Assn.**—*Rice J.*, 56, 3, p. 40, 1953.

Sunbonnet, a new rice variety developed at the Rice Experiment Station [Louisiana] in co-operation with the Division of Cereal Crops and Diseases, United States Department of Agriculture, was a re-selection from Bluebonnet (Rexoro × Fortuna) [*R.A.M.*, 26, p. 125]. It is more resistant to leaf spot (*Cercospora* [*oryzae*: ibid., 26, p. 261]) than the latter, has superior agronomic characters, and is being released through the Louisiana Seed Rice Growers' Association.

Toyoda (S.) & Suzuki (N.). **Histochemical studies on the lesions of Rice blast caused by Piricularia oryzae Cav. I. Some observations on the sporulations on lesions of different types occurring on leaves of the same variety.**—*Ann. phytopath. Soc. Japan*, 17, 1, pp. 1–4, 1 pl., 1 fig., 2 diags., 1952. [Japanese, with English summary. Received March, 1953.]

Lesions produced on the leaves of a susceptible rice variety by the blast fungus

(*Piricularia oryzae*) [*R.A.M.*, 32, p. 276] were grouped into five classes according to their size and the degree of brown discoloration. Sporulation on a single class 4 lesion was observed and photomicrographed at certain intervals in a specially designed moist chamber. The first conidium was produced at the apex of the conidiophore after seven hours and was fully developed forty minutes later. Soon afterwards a second conidium developed at the apex of a branch immediately below the first. In this manner up to nine conidia were produced by sympodial branching at intervals of about an hour.

Sporulation was most rapid and abundant on class 4 lesions, less on 5 and 3, very scarce on 2, and entirely absent on 1. It is probable that the browning of the lesion retards the spread and normal growth of the mycelium in the host tissue and, consequently, sporulation.

Ōtani (Y.). **Growth factors and nitrogen sources of Piricularia oryzae Cavara.**—*Ann. phytopath. Soc. Japan*, 17, 1, pp. 9–15, 8 figs., 1952. [Japanese, with English summary. Received March, 1953.]

Cultural experiments on synthesized media demonstrated that biotin is essential for the growth of the rice blast fungus, *Piricularia oryzae* [see preceding abstract], the optimum concentration lying between 2·3 and 3 mγ/ml. Vitamin B_1 was a complementary growth factor. Biotin was detected in minute amounts in most nutrient media. Nitrate was a good source of nitrogen while glycocoll, l-alanine, aspartic acid, d-glutamic acid, and asparagine were even better.

Choice of clones and clonal seedlings: planting recommendations for 1952–3.—*Circ. Rubb. Res. Inst. Malaya* 37, 6 pp., 1952.

Among *Hevea* rubber clones recommended for large-scale planting in Malaya are R.R.I. 501 and R.R.I. 513, neither of which is susceptible to brown bast [cf. *R.A.M.*, 32, p. 148].

McLennan (E. I.) & Ducker (S. C.). **The description and distribution of the species of Penicillium Link in some Victorian soils.**—*Proc. roy. Soc. Vict.*, N.S., 64, 1, pp. 10–71, 1 pl., 40 figs., 1952.

This is an account of 45 species of the genus *Penicillium* [*R.A.M.*, 10, p. 339] and their vertical distribution in Mallee soil (alkaline throughout), loam from the alpine regions of the Bogong High Plains, and sandy podsols (pH levels of 4·6, 4·8, and 5·2) near the southern coast of Victoria. They were isolated on Czapek and malt agar dilution plates and studied on malt, Czapek, and Raulin-Thom agars at pH 6·9 to 7. The majority of the species were found to belong to the *Monoverticillata* and the *Asymmetrica-Divaricata*. Dichotomous diagnostic keys are included. A number of strains were tested for antibiotic properties.

Kudrina (Mme E. S.). Влияние гуминовой кислоты на некоторые группы почвенных микроорганизмов и ее значение для этих организмов как источника питательных веществ. [Influence of humic acid on certain groups of soil micro-organisms and its importance as a source of food material to these organisms.]—Труд. почвенного Инст. Докучаева. [*Trans. Dokuchaev Soil Inst.* = *Trav. Inst. Dokutchaev*], 38, pp. 185–253, 2 pl., 4 figs., 1951. [Received 1953.]

In studies on the action of humic acid on various soil micro-organisms a small quantity only (0·04 to 0·2 per cent., the lower dose being most effective) had some stimulating influence on the growth of pure cultures of *Aspergillus niger* [cf. *R.A.M.*, 31, p. 448]. Above 0·2 per cent. it has a depressing effect. On *Penicillium 'glaucum'* [cf. ibid., 30, p. 532] it was inhibiting at all concentrations. *A. niger* was able to utilize the carbon of humic acid (extracted from black soil) to a very small degree,

nitrogen (particularly if the acid were sterilized) being more available to it. *P. 'glaucum'* on liquid nutrient media was unable to utilize the carbon and used very little of the nitrogen of both humic acid and brown humic matter, but all doses of the latter, 0·2 per cent. being most effective, stimulated its growth.

Doguet (G.). **Rhinotrichum multisporum n.sp. Champignon isolé d'un sol de Madagascar.** [*Rhinotrichum multisporum* n.sp. A fungus isolated from a Madagascan soil.]—*Rev. Mycol.*, 17, *Suppl. colon.* 2, pp. 74–79, 2 figs., 1952.

A description [without a Latin diagnosis] is given of *Rhinotrichum multisporum* n.sp., isolated from soil taken from beneath cacao and pepper [*Piper nigrum*] plants in Madagascar.

Atkinson (R. G.). **A new species of Heterosporium from soil.**—*Mycologia*, 44, 6, pp. 813–822, 9 figs., 1952.

A full description is given of *Heterosporium terrestre* n.sp., isolated from soil obtained from Ancaster, Ontario, Canada.

Subramanian (C. V.). **Fungi isolated and recorded from Indian soils.**—*J. Madras Univ.*, Sect. B, 22, 2, pp. 206–222, 1952. [Received May, 1953.]

This is a systematic list, arranged alphabetically under genera, of 410 fungi either isolated or recorded from soils in India. Most of the records are included in the three lists of Indian fungi [see next abstracts], and the list references are given.

Ramakrishnan (K.) & Subramanian (C. V.). **The fungi of India—a second supplement.**—*J. Madras Univ.*, Sect. B, 22, 1, pp. 1–65; 2, pp. 163–182, 1952. [Received May, 1953.]

This second supplement to the fungi of India [cf. *R.A.M.*, 18, p. 57], covering the period 1938–51 inclusive, contains 812 species arranged in alphabetical order under genera [cf. preceding and next abstracts], bringing the number recorded so far to 3,680. Both species and genera are accompanied by the reference in Saccardo's Sylloge. Part 2 comprises an alphabetical list of hosts and substrata. There is a bibliography of 247 references.

Subramanian (C. V.). **Fungi Imperfecti from Madras—I. II.**—*Proc. Indian Acad. Sci.*, Sect. B, 36, 2, pp. 43–53; 4, pp. 160–168, 12 figs., 1952. [Received April, 1953.]

The first two papers in this series listing and describing the Fungi Imperfecti occurring in Madras State [cf. *R.A.M.*, 32, p. 103 and preceding abstracts] includes a new genus, two new species, and nine new records for India.

Ahmed (Q. A.). **Fungous flora of Dacca and suburbs I.**—*Bull. bot. Soc. Beng.*, 5, 1, pp. 51–54, 1951. [Received June, 1953.]

The author's list of species includes several pathogens of crop plants in East Bengal [*R.A.M.*, 32, p. 401].

Katsuki (S.). **Materials for Cercospora-flora of the Kanto District. (2)**—*Ann. phytopath. Soc. Japan*, 17, 1, pp. 5–8, 2 figs., 1952. [Received March, 1953.]

The second contribution in this series [cf. *R.A.M.*, 32, p. 341] contains notes on 25 species of *Cercospora* [see next abstract] found in the Kanto district of Japan, two of which are described as new.

Togashi (K.) & Katsuki (S.). **New or noteworthy Cercosporae from Japan.**—*Bot. Mag., Tokyo*, 65, 763–764, pp. 18–26, 12 figs., 1952. [Received January, 1953.]

This annotated list of 26 species of *Cercospora* occurring in Japan [see preceding abstract] includes descriptions of 13 new species and one new combination.

Hiratsuka (N.) & Sato (S.). **Inoculation experiments with heteroecious species of the Japanese rust fungi IV.**—*Bot. Mag., Tokyo*, 64, 761–762, pp. 219–222, 1951. [Received January, 1953.]

Seven *Puccinia* species are studied in this continuation of the writers' inoculation experiments with heteroecious Japanese rusts [cf. *R.A.M.*, 15, p. 609].

Jørstad (I.). **The Uredinales of Iceland.**—*Skr. norske VidenskAkad., 1951*, 2, 87 pp., 2 maps, 1952.

This is an annotated list of 51 rust species, including 13 new records, collected in Iceland [*R.A.M.*, 12, p. 469] during 1937 and 1939. There are 24 new host records for the country.

Gilman (J. C.) & Tiffany (Lois H.). **Fungicolous fungi from Iowa.**—*Proc. Iowa Acad. Sci.*, 59, pp. 99–110, 18 figs., 1952.

This annotated list includes representatives from all classes of fungi with host ranges for each.

Wehmeyer (L. E.). **The genera Leptosphaeria, Pleospora, and Clathrospora in Mt Rainier National Park.**—*Mycologia*, 44, 5, pp. 621–655, 24 figs., 1952.

This annotated list of 18 species of *Leptosphaeria* (two of which are new), 12 of *Pleospora* (one new variety) [cf. *R.A.M.*, 32, p. 343], and three of *Clathrospora* (two new) [cf. ibid., 32, p. 102] collected by A. H. Smith in Mt Rainier National Park [Washington] in the summer of 1948 includes *L. vagans*, *L. typharum*, *L. culmifraga* [cf. ibid., 11, p. 772], and *L. asparagina* on various grasses. The collections of *L. vagans* resemble in all respects those described as *L. typharum*, except that the asci are broader and the spores larger and broader, with more broadly rounded ends. All the collections of *L. vagans* and *L. typharum* were made at elevations over 5,500 ft. *L. culmifraga* was one of the most common species on grasses, especially at the lower altitudes, where it occurred in almost every collection. It differs from *L. typharum* in its larger, more spherical, more tomentose, and more scattered perithecia. *L. asparagina* occurred rather frequently, mainly on grasses, but occasionally on dicotyledons; all the collections came from elevations of 4,600 feet or under.

Ervin (Marion D.). **Phacidiales of Iowa.**—*Proc. Iowa Acad. Sci.*, 59, pp. 89–98, 5 figs., 1952. [Received June, 1953.]

Descriptions are given, with keys to the families, genera, and species [cf. *R.A.M.*, 11, p. 804].

Sparrow (F. K.). **Phycomycetes from the Douglas Lake region of northern Michigan.**—*Mycologia*, 44, 6, pp. 759–772, 1 fig., 1952.

This annotated list of 54 aquatic phycomycetes and one member of the Mucorales collected in 1948 and 1950 in northern Michigan includes five new species of Chytridiales and a Latin diagnosis of the family Physodermataceae n. fam.

Shaw (C. G.) & Hubert (E. E.). **A review of the Leptographium–Scopularia-Hantzschia nomenclature.**—*Mycologia*, 44, 5, pp. 693–704, 3 figs., 1952.

Blue-staining organisms of the *Scopularia–Leptographium* type are of common

occurrence on western white pine (*Pinus monticola*) in Idaho and British Columbia, while fungi causing blue stain have been associated also with symptoms typical of pole blight [*R.A.M.*, 32, p. 408]. The nomenclature of the imperfect states of these fungi requires to be brought into conformity with the International Rules. Examination of the type collection of *Hantzschia* [*Leptographium*] *phycomyces* Awd. [ibid., 12, p. 409] (from the herbarium of the University of Wisconsin) showed that the fungus agreed exactly with the illustrations published by Auerswald (*Hedwigia*, 2, pp. 60–62, 1863, pl. XI) and was unquestionably congeneric with that seen by the authors on western white pine and lodgepole pine (*P. contorta* var. *latifolia*). Acceptance of the generic name *Hantzschia* would necessitate the transfer of those species described for *Scopularia* Preuss (a later homonym of *Scopularia* Lindler) and *Leptographium* (antedated by *Hantzschia*) to this genus, but the name is already in current usage for a genus of diatoms. Therefore, the authors propose that it should be rejected. Attempts to locate a type of *S. venusta* Preuss were unsuccessful; *Scopularia* Preuss is therefore a *nomen dubium* and *Leptographium* becomes available for that fungus. The synonymy involved is listed but no changes are made.

Luc (M.). **Ophiostoma moniliforme (Hedgc.) H. et P. Syd. et ses diverses formes.** [*Ophiostoma moniliforme* (Hedgc.) H. & P. Syd. and its various forms.]—*Rev. Mycol.*, 17, *Suppl. colon.*, 1, pp. 10–16, 2 figs., 1952.

The author distinguishes between *Ophiostoma moniliforme* f. *typica* (≡ *Ceratostomella moniliformis*) [cf. *R.A.M.*, 14, p. 274; 16, p. 72, and next abstract], which has perithecia 99 to 180 μ in diameter, bearing on the outer surface conical spinules 12 to 16 by 6 μ, and apical hairs 12 by 18 by 2 μ, ascospores 4 to 5 by 3 to 5 μ, and cylindrical conidia 6 to 8 by 1·5 to 2·2 μ; *O. moniliforme* f. *davidsonii* n.f. (= *Endoconidiophora moniliformis*) [ibid., 29, p. 340] with larger perithecia 170 to 266 by 150 to 200 μ with a very long neck up to 1,000 μ, and longer apical hairs (15 to 25 μ), cylindrical (6 to 20 by 2·5 to 3 μ) and barrel-shaped (5 to 7 by 4·5 to 6 μ) conidia; *O. moniliforme* f. *pycnanthi* n.f. from blackened wood of *Pycnanthus kombo* in French Cameroons with spiny perithecia 220 to 280 μ high and 200 to 260 μ in diameter and cylindrical conidia 5 to 7·5 by 2 to 4 μ; and *O. moniliforme* f. *theobromae* n.f., isolated from cacao roots in Madagascar, with perithecia beset with brown hairs and rarely up to 200 μ in diameter, long apical hairs, smaller ascospores, and two types of conidia 6 to 20 by 1·5 to 3·5 and (very occasionally) 9 to 11 by 5 to 6 μ.

Moreau (C.). **Coexistence des formes Thielaviopsis et Graphium chez une souche de Ceratocystis major (van Beyma) nov. comb. Remarques sur les variations des Ceratocystis.** [Coexistence of the forms *Thielaviopsis* and *Graphium* in a strain of *Ceratocystis major* (van Beyma) n. comb. Remarks on variations in *Ceratocystis*.]—*Rev. Mycol.*, 17, *Suppl. colon.*, 1, pp. 17–25, 1 fig., 1952.

In January, 1952, the planks of lemon boxes arriving in Paris from Lebanon bore (on the sapwood parts only) black patches of *Thielaviopsis*. A few days later perithecia of *Ceratocystis major* n. comb. [cf. *R.A.M.*, 30, p. 497], together with coremia of *Graphium*, appeared. Both conidial forms were obtained in pure culture, this being apparently the first time that they have been secured together. *Ceratostomella major* (= *Ophiostoma majus*) [cf. ibid., 19, p. 116] is for reasons of priority transferred to *Ceratocystis*. The species is near *C. adiposa* (= *Ceratostomella adiposa*) [ibid., 7, p. 272], which also has a *Thielaviopsis* conidial state. *Sphaeronaemella helvellae* [ibid., 22, p. 373] is transferred to *Ceratocystis*, the latter name, though of later date, being adopted because the former is applied, as was originally intended, to Sphaeropsidales. *Ceratostomella radicicola* [ibid., 21, p. 13] appears to be a strain of *C.* (*Ceratocystis*) *paradoxa* [ibid., 8, p. 227]. *Endoconidiophora variospora* [ibid., 24, p. 37] and *C. wilsoni* [ibid., 30, p. 497] are transferred

to *C. moniliformis* [see preceding abstract] as *C. m.* f. *variospora* and *C. m.* f. *wilsoni*. *Ophiostoma* (*Rostrella*) *coffeae* [ibid., 30, p. 366] is also considered to be a form of this species. The author lists all the species he considers should be included in *Ceratocystis* classified under their conidial states. It includes *C.* [*Ceratostomella*] *ulmi*, *Ceratocystis* [*Ceratostomella*] *ips*, *Ceratocystis* [*Ceratostomella*] *pilifera*, and *Ceratocystis* [*Ceratostomella*] *pini*.

Loos (C. A.). **Report of the Acting Pathologist for the year 1950.**—*Bull. Tea Res. Inst. Ceylon* 32, pp. 41–45, 1952.

Most of the information in this and other sections of this annual report [cf. *R.A.M.*, 31, p. 210] on tea diseases has already been noticed from other sources [loc. cit. and ibid., 30, p. 586]. The crop returns in lb. made tea per acre for the five-plot Kataboola experiment on loss of crop [due to *Exobasidium vexans*: ibid., 32, p. 104 and next abstracts] are now revised up to 31st December, 1950 [cf. ibid., 30, p. 588], plots 2 and 3 (sprayed with perenox, 4 lb. to 10 gals. water at 10 gals. per acre) and 4 giving an increase of 47 (weekly spraying), 26 (sprayed every 10 days), and 22 (unprotected but plucked to fish leaf at 7-day rounds) lb., respectively, over plot 1 (unprotected, plucked at 10-day intervals), while plot 5 (unprotected, with 7-day normal plucking) showed a loss of 44 lb.

On some estates *Poria* [*hypolateritia*: ibid., 32, p. 216] has been allowed to develop unchecked for a considerable period so that the high mortality rate is again causing concern. The importance of control by removing diseased bushes at the earliest opportunity is emphasized.

On p. 57 M. V. de Silva states that a clone with an unusually large leaf and apparently resistant to *E. vexans* was found on a small holding and is being propagated.

Loos (C. A.). **Studies in blister blight control. XI. Dusting against blister blight on Alupolla Group, Ratnapura.**—*Tea Quart.*, 23, 3, pp. 76–80, 1952.

In continuation of the studies in this series on the control of blister blight of tea [*Exobasidium vexans*] in Ceylon [see preceding and next abstracts] tests were made from July to December, 1951, on Alupolla Group, Ratnapura, a low-country area, previous tests having been confined to up-country estates.

Two per cent. cuprosana was generally insufficient. The 4 per cent. dust applied at 5 lb. per acre every five days by the 'Armada' portable hand duster gave very good results. Six per cent. cuprosana applied with a Whirlwind power duster supplemented by the 'Armada' (5 lb. every five days) to tea recovering from pruning until recovery was well established, followed by 6 lb. of 4 per cent. every seven days, gave excellent control, equivalent to that obtained by weekly spraying with a wettable copper fungicide (4 oz. in 10 gals. water).

Crop protection costs based on the cost per lb. made tea, assuming protection of 1,000 acres and a crop of 600 lb. per acre, were as follows. Whirlwind dusting with 4 per cent. cuprosana at 4 lb. per acre every five days, 7 lb. every ten days, or 6 per cent. at 5¼ lb. every ten days costs 13·8, 12·7, and 10 cents, respectively; 'Armada' dusting with 4 per cent. cuprosana at 4 lb. every five days, 8 lb. every ten days, or 6 per cent. at 5¼ lb. every ten days 13, 12·2, and 9·5 cents, respectively: knapsack spraying with cuprokylt (6 oz.) every ten days employing specially recruited labour 25·7 cents, and the same but with no extra labour costs 10·1 cents.

A series of recommendations for efficient dusting methods is given.

Webster (B. N.). **Infection chains and Acacias.**—*Tea Quart.*, 23, 3, pp. 70–72, 1952.

The author discusses briefly the principle of infection chains in plant diseases with specific examples, and the means of combating them. Chains may be interrupted or continuous according to whether the pathogen exists saprophytically

during part of its life-cycle or must pass directly from host to host. Most discontinuous chains may be subdivided into homogeneous and heterogeneous. In the former the pathogen is limited to one host species or group of species, for example, blister blight fungus (*Exobasidium vexans*) [see preceding abstracts], while in the latter type of chain e.g., *Cercosporella* disease of tea caused by *Calonectria theae* [*R.A.M.*, 31, p. 210], the pathogen may be able to attack many hosts and also exist as a saprophyte. Of the hosts of *C. theae*, *Acacia decurrens* [loc. cit.] is particularly significant in that it suffers severe infection which is transmitted to tea bushes in its shade. Experiments on the lopping of acacias during wet, misty weather, and testing for resistance are envisaged.

Webster (B. N.). **A note on pathological matters.**—*Tea Quart.*, 23, 3, pp. 84–85, 1952.

Recently there have been numerous cases of defoliation of nursery *Albizzia* plants by *Pleiochaeta albizziae* [*R.A.M.*, 29, p. 251; 30, p. 584]; infection starts as macroscopic, yellow-brown lesions. Either the plants are killed or their development is seriously retarded. Efficient control is secured by weekly spraying with any common copper-based fungicide at the rate of 3 oz. in 5 gals. water until planting out.

Several instances of tea being severely attacked by brown blight [*Glomerella cingulata*: ibid., 30, p. 491] coincided with lopping of low shade trees during the dry period, the fungus having penetrated the sun-scorched tissues. It is advisable to lop as gradually as possible during a long dry period.

Two root diseases caused by *Irpex subvinosus* [ibid., 17, p. 202; 19, p. 369] have recently been found, one on *Acacia decurrens* shading tea on a Dimbula estate and the other on *Crotalaria agathifolia* at St. Coombs. The leaves of *A. decurrens* turned yellow-brown and hung downwards on the tree for some time. The bark was cracked at the collar and bore sheets of yellowish-white mycelium which turned a lilac colour within 24 hours. Lilac mycelium also grew beneath the lateral roots and lilac fructifications developed over most of the root surface in a few days. On *C. agathifolia* infection evidently originated several feet from the ground, the principal fructifications occurring beneath the stumps of lopped branches and at the collar. Tea bushes adjacent to both sites were apparently healthy but are under observation.

Haworth (F.). **Minor element nutrition of the Tea bush in Ceylon.**—*Tea Quart.*, 23, 3, pp. 67–69, 1952.

On a few Ceylon tea estates where the bushes are apparently well grown and healthy, yields of only 500 lb. made tea per acre per annum are obtained in spite of high fertilizer applications. Cattle manure at 6 to 8 tons per acre, however, gave remarkable yield increases. To test for possible minor nutrient deficiency five plots of 300 bushes each, on each of four different soil types (fine sandy loam, gravel, clay, and clay loam), were sprayed with a minor element mixture, weekly for five weeks before tipping, five equivalent plots being left unsprayed. There was no response attributable to treatment on any of the sites and it is concluded that, for the present, minor element deficiencies are unlikely to limit yields significantly in the main tea-growing areas of Ceylon.

Valleau (W. D.) & Troutman (J. L.). **A review of the wildfire problem in Kentucky Tobacco.**—*Bull. Ky agric. Exp. Sta.* 570, 8 pp., 1951. [Mimeoprinted. Received 1952.]

Tobacco wildfire [*Pseudomonas tabacum*: *R.A.M.*, 32, p. 368] was unusually

prevalent in plant beds in Kentucky and neighbouring States during 1950 and 1951. The position thirty years ago when angular leaf spot [*P. angulata*: ibid., 24, p. 404; 28, p. 25] was common and wildfire rare is now completely reversed. A survey in 1950 indicated that spring-ploughed beds were more subject to wildfire infection than autumn-ploughed, the latter being entirely free except where water from the surrounding area drained across them.

During 1951 more than eight miles of beds 12 ft. wide were examined for the disease. All but 5,700 ft. was treated with copper sulphate and of the remainder one-third was ploughed in spring and the rest in autumn. Infection in the spring- and autumn-ploughed beds amounted to 56·5 and 28·9 per cent., respectively, infection being based on the number of 100 by 12 ft. beds showing wildfire. Of the autumn-ploughed beds those steamed or gassed with methyl bromide carried 23·4 and 29·4 per cent. infection, respectively, as against 47·3 per cent. for burned beds; the corresponding figures for those treated with copper sulphate-lime were 9·2, 12·7, and 44·1 per cent. In thoroughly steamed spring-ploughed beds (with or without copper sulphate) there was no wildfire, while 58·6 per cent. of the burned, treated beds were infected.

A comparison of these results with those of 1936–9 [ibid., 19, p. 617] suggests that radical alteration in the methods of applying control measures is required; that infection in treated beds may be due to water flowing through the surrounding vegetation and conveying the organism to beds that were not properly ditched; that copper sulphate-lime is sometimes applied after infection has occurred, or else the bacteria are carried to the surface when the fungicidal coating is broken in weeding, or washed by heavy rain to the surface of the leaves in recently ploughed and lightly burned beds. To be effective copper sulphate-lime should cover the ground thoroughly before infection takes place, i.e., when the plants are very small.

A few growers as well as the Experiment Station have been using permanent plant bed sites for several years with marked success in raising good plants free from wildfire. The beds are disked and sown with soybeans as soon as setting is finished and in the autumn they are ploughed and steamed, treated with methyl bromide, or burned. Copper sulphate-lime is applied in the spring when the plants are just above ground, a few days later, and sometimes after weeding. On one farm this procedure has been followed on beds ranging from 9,000 feet to two or three times that amount, and neither wildfire nor angular leaf spot has been observed, even on one bed not treated with copper sulphate-lime. Beds in an area previously left to weeds were completely free from wildfire in 1951 after autumn-ploughing and steaming.

Valleau (W. D.), Johnson (E. M.), & Diachun (S.). **Tobacco diseases.**—*Bull. Ky agric. Exp. Sta.* 581, 62 pp., 35 figs., 1952.

This bulletin, a revision of No. 437 [*R.A.M.*, 22, p. 410], includes notes on the symptoms, cause, severity, and control of the parasitic and physiologic disorders of tobacco in Kentucky [see preceding abstract].

Wolf (F. A.) & Sharp (D. G.). **Hereditary abnormalities in Tobacco.**—*J. Elisha Mitchell sci. Soc.*, 68, 1, pp. 85–92, 3 pl., 1 fig., 1952.

An account is given of two heritable structural abnormalities of cultivated tobacco in the United States, 'ruffles' and 'toad-skin'. Both are characterized by leaf enations [*R.A.M.*, 31, p. 259], in the former on the upper surface and in the latter on the lower. The disorders were not graft-transmitted and no virus particles were found in expressed sap. In hybridization tests ruffles behaved as dominant and toad-skin as recessive to normal.

Cuzin (J.), Rey (P.), & Schwartz (D.). **Le muffe del Tabacco. Studio qualitativo e quantitativo.** [The moulds of Tobacco. A qualitative and quantitative study.]—*Tabacco, Roma*, 56, 635, pp. 163–177, 1952.

Examination of tobacco in process of manufacture in Italy showed that 'mouldiness' was due to bacteria, including *Bacillus subtilis* and various Enterobacteriaceae, yeasts, *Aspergillus* spp., especially *A. repens*, *A. chevalieri*, and *A. amstelodami*, *Penicillium 'glaucum'*, *P. nigricans*, and *Mucor* spp. Of 60 representative fungal isolations 46 were *Aspergillus* spp. and 14 were *Penicillium* spp. or Mucoraceae.

By using a special method [which is described] for estimating the potential mould infection of a large quantity of tobacco an 'index of mould expression', equivalent to the number of monospore colonies developing on a small sample of the bulk placed in standard conditions of temperature, humidity, etc., was determined. It was found that treatment of tobacco during manufacture with a quaternary ammonium compound in one instance significantly reduced the 'index of mould expression' from 133 to 93.

Orillo (F. T.). **An undescribed species of Melanconium on Tomato in the Philippines.**—*Philipp. Agric.*, 35, 6, pp. 338–339, 1951. [Received March, 1953.]

In January, 1951, at least 5 per cent. of the tomato fruits grown in the vegetable garden of the University of the Philippines Rural High School, College of Agriculture, Laguna, were affected by rot. Fruit in all stages of infection was also present in local shops; even when infection was slight the market value was reduced. Under both field and laboratory conditions fruit was affected at all stages of development. The lesions were firm, brown to dark brown, oval or circular, flattened or slightly depressed, and the bordering tissue was discoloured and slightly sunken. The lesions enlarged to ½ in. or more in diameter and became conspicuously marked with greenish-black concentric bands composed of conidial masses. The fruits eventually mummified or dropped off.

The fungus is assigned to *Melanconium lycopersici* n. sp. [cf. *R.A.M.*, 16, p. 70], having short, erect, hyaline, non-septate, simple or branched conidiophores 2 to 5·5 by 1·1 to 2·8 (average 3·4 by 2·2) μ, and thin-walled, continuous, oblong conidia, hyaline when young, pale green when mature, borne singly at the ends of the conidiophores, and measuring 3·6 to 12·2 by 1·5 to 3·3 (average 7·3 by 2·5) μ.

Nema (K.G.). **Oospora rot of Tomato in Madhya Pradesh.**—*Nagpur agric. Coll. Mag.*, 26, 1–4, p. 15, 1952.

In September, 1950, tomato fruits with a watery soft rot were observed in the Nagpur vegetable market, India. The pathogenicity of the causal organism (*Oospora lactis*) [*R.A.M.*, 26, p. 426; 29, p. 338] was established by wound inoculation experiments.

Mezzetti (A.). **La 'macchiettatura batterica' dei frutti di Pomodoro prodotta dalla Pseudomonas tomato (Okabe) Breed et al.** ['Bacterial speck' of Tomato fruits caused by *Pseudomonas tomato* (Okabe) Breed *et al.*]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 19–34, 1 pl., 2 figs., 1952. [English summary.]

This paper on the disease in Italy has already been noticed from another source [*R.A.M.*, 31, p. 36].

Wilkinson (J.). **Some effects induced in Nicotiana glutinosa by the 'aspermy' virus of Tomato.**—*Ann. Bot., Lond.*, N.S., 17, 66, pp. 219–223, 1 pl., 1953.

At University College, Exeter, inoculation of *Nicotiana glutinosa* with the tomato aspermy virus [*R.A.M.*, 29, p. 180; 32, p. 402] caused necrosis of some anthers

and ovaries but many sporulated. There were abnormalities in the first meiotic division; pairing failed in one or sometimes two or three bivalents, resulting in a proportion of chromosome-deficient gametes and consequent production of misshapen pollen grains and microcytes.

Murray (J. S.). **Recent research on forest pathology in Holland.**—*Quart. J. For.*, 47, 1, pp. 41–47, 1953.

This information on current forest pathology research in Holland was obtained during an eight-day visit in May, 1952. Poplar No. 214 from Professor Picarolo in Italy has so far proved fast-growing and resistant to bacterial canker [*Pseudomonas rimifaciens* and *P. syringae* f.sp. *populea*: *R.A.M.*, 32, p. 107].

Until recently elms in Holland attacked by Dutch elm disease [*Ceratostomella ulmi*: ibid., 31, p. 637] had to be destroyed, but as only 5 per cent. of the trees now remain this policy has had to be abandoned. Nearly all Dutch elms are of the same species and have been propagated by grafting. In testing for resistance inoculations are performed for five years in May and June (but not the year following transplanting) by making a ring of hypodermic injections round the stem with a spore suspension. Plants are then propagated by grafting and tested for a further five years when they are examined for resistance to *N. cinnabarina*, the resistant ones being distributed to the trade. Such protracted testing is necessary as the results vary considerably from year to year. Work with *Nectria* is complicated by the fact that the fungus loses its virulence in culture after a year and there are many different strains of varying pathogenicity.

In view of the fact that inoculation tests with fungal isolates [? including *Leptothyrium* sp.] have failed to reproduce the symptoms of dieback of Norway spruce [*Picea excelsa*: ibid., 30, p. 86; 31, p. 637] it is now believed that the disease in Holland is caused by the lowering of the water table by the abnormally low rainfall during the past few years coupled with a greater water demand on the part of the crop. The author considers, however, that although there is some evidence to support this theory the search for a parasite should continue.

The results of the 1950–51 experiments on the role of *Phomopsis pseudotsugae* in causing canker of Japanese larch [*Larix leptolepis*: ibid., 32, p. 157], although not yet complete, demonstrated clearly that the greatest damage was caused by December brashing and the least by July brashing. In a mixed stand European larches were almost completely cankered on the stems by *Dasyscypha* [spp.: ibid., 32, pp. 107, 406] while Japanese larches were completely free [cf. ibid., 18, p. 74].

On Dr. van Vloten's private estate trees of *Pseudotsuga taxifolia* were over 20 ft. high and quite healthy, while adjacent *P. t.* var. *caesia* were attacked by leaf cast (*Rhabdocline pseudotsugae*) [ibid., 19, p. 178; 32, p. 410] and averaged only about 7 ft., and many individuals of *P.* [*t.* var.] *glauca* were dead, the survivors being about 2 ft. high.

Jevtić (M.). **Neka zapažanja u vezi sa upotrebom plavog kamena za suzbijanje fuzarioze u šumskim rasadnicima.** [Some observations on the use of copper sulphate for controlling fusariosis in forest nurseries.]—*Šumarstvo*, 5, 1, pp. 52–56, 1952. [Abs. in *For. Abstr.*, 14, 2, p. 181, 1953.]

Aqueous solutions of copper sulphate, 0·3 to 0·5 per cent. used at the rate of 6 to 10 l. per sq. m. or 0·5 to 0·7 per cent. at 4 to 6 l. per sq. m., applied to heavy, clayey, and moist soil, gave good control of *Fusarium* spp. in pine nurseries [cf. *R.A.M.*, 32, p. 111] in Yugoslavia. The seedlings in untreated plots died.

Malençon (G.) & Marion (J.). **L'Hypoxylon mediterraneum (DNtrs.) Ces. et DNtrs. et son comportement épiphytique dans les chênaies nord-africaines.** [*Hypoxylon mediterraneum* (de Not.) Ces. & de Not. and its epiphytic behaviour

in North African Oak plantations.]—*Rev. Mycol.*, 17, *Suppl. colon.* 2, pp. 49–73, 1 fig., 1952.

Hypoxylon mediterraneum [*R.A.M.*, 31, p. 409] is present in epidemic form on broad-leaved trees in Algeria and Tunisia. Under various names it has been recorded on *Quercus mirbeckii*, *Q. fruticosa*, *Castanea* sp., beech, *Platanus orientalis*, and *Populus tremula*, in addition to other hosts [loc. cit.]. It is mainly confined to the western part of the Mediterranean region, having also been reported in southern France, continental and peninsular Italy, Sardinia, and Portugal, and, rarely, from the Rhine area. It is not highly pathogenic, but gradually kills wounded or sickly trees. There is a close connexion between the development of an epiphytotic and the condition of the trees. Unsatisfactory soil and other conditions favour attack by reducing host resistance. Cork oaks (*Q. suber*) [loc. cit.] are rendered more susceptible when treated with lack of care and sustain numerous injuries; drought is also a damaging influence. Improved silvicultural practices are necessary.

Marchionatto (J. B.). **'Phytophthora cinnamomi' sobre Castaño en la Argentina.** [*Phytophthora cinnamomi* on Chestnut in Argentina.]—*Rev. argent. Agron.*, 20, 1, pp. 4–6, 1 fig., 1953.

In December, 1951, European chestnuts growing in the Botanic Garden of the Faculty of Agronomy and Veterinary Science, Buenos Aires, were found to be seriously affected by *Phytophthora cinnamomi*, a new host record for Argentina [cf. *R.A.M.*, 30, p. 433].

Clapper (R. B.). **Relative blight resistance of some Chestnut species and hybrids.**—*J. For.*, 50, 6, pp. 453–455, 1 fig., 1952.

During trials for resistance to chestnut blight (*Endothia parasitica*) [*R.A.M.*, 32, p. 156] in the federal test plots near Glenn Dale, Maryland, started on 8th July, 1943, more than 2,200 inoculations with pure monospore cultures were made on the east side of the trunk of 1,400 trees between five and 13 years old. Seedlings under five years old were not used because of difficulty in infecting them, particularly if derived from resistant parents. The relative progress of infection was best observed on cankered areas 10 months after inoculation. The F_1 from crosses between *Castanea mollissima* and *C. dentata* showed promise for use as timber trees and appeared to be sufficiently resistant for extensive experimental planting when a practical method is devised for increasing the stock on a large scale. Back-crosses to *C. mollissima* showed a resistance equal to that of the latter parent but in other respects were less satisfactory than the F_1 trees. It is suggested that two pairs of genes control resistance to blight.

Biraghi (A.). **Nuovi ospiti di Endothia parasitica.** [New hosts of *Endothia parasitica*.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 35–44, 9 figs., 1952. [English summary.]

This paper on the infection of oaks by *Endothia parasitica* in Italy has already been noticed from another source [*R.A.M.*, 29, p. 545].

Biraghi (A.). **Il disseccamento fogliare del Castagno causato da 'Sphaerella maculiformis'.** [Leaf withering of Chestnut caused by '*Sphaerella maculiformis*'.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 157–160, 1952.

In [? 1950] chestnuts in all parts of Italy, particularly in Umbria, Abruzzi, and Sicily, were severely infected by leaf disease (*Sphaerella* [*Mycosphaerella*] *maculiformis*) [cf. *R.A.M.*, 31, p. 39]. Favoured by heavy rains and low temperatures during the summer, infection began in July or August and caused premature leaf fall, with resultant heavy loss of yield. Japanese chestnuts (*Castanea crenata*)

remained immune, and in hybrid populations of seedlings grown in the nursery, those with well-marked characteristics of *C. crenata* were unaffected, while those resembling *C. sativa* were attacked, infection being most severe on the seedlings most like *C. sativa*.

Mezzetti (A.). **Osservazioni sulla morfologia e sulla tassonomia del Gyroceras celtidis (Biv.) Mont. et Ces.** [Observations on the morphology and taxonomy of *Gyroceras celtidis* (Biv.) Mont. & Ces.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 125–135, 2 pl., 6 figs., 1952. [English summary.]

This paper on *Gyroceras* [*Helicoceras*] *celtidis* infecting beam trees (*Celtis australis*) in Italy has already been noticed from another source [*R.A.M.*, 30, p. 203].

Roth (E. R.). **Sprout Oak decay.**—*Amer. Forests*, 59, 1, pp. 35, 43, 4 figs., 1953.

Studies of sprouts from cut oak stumps in many eastern and some mid-western States of U.S.A. showed that in one sprout out of every four the normal decay of the parent stump had spread into it and caused extensive butt rot (*Stereum gausapatum*) [*R.A.M.*, 22, p. 333]. Sprouts of all oak species important in the eastern United States are susceptible to rot from the parent stump. On 45 sample plots an average of 25 per cent. of the trees averaging 35 years old were butt-rotted. Buds high on the stump contract rot readily but buds at or below ground line were usually healthy. It is recommended, therefore, that while the stand is under 20 years old the sprouts should be reduced to a single one of low origin from each small stump.

Jain (A. C.) & Mahmud (K. A.). **Collar rot of Murraya kœnigii Spreng.**—*Nagpur agric. Coll. Mag.*, 26, 1–4, p. 18, 1952.

In October, 1950, young transplanted seedlings of *Murraya kœnigii* at Nagpur, India, were affected by collar rot due to *Corticium solani*, a new record for this host. Pathogenicity was established by inoculation experiments, the organism being reisolated in every case.

Biraghi (A.). **Il disseccamento degli Abeti di Vallombrosa.** [The withering of the Firs in Vallombrosa.]—*Boll. Staz. Pat. veg. Roma*, Ser. 3, 8 (*1950*), pp. 137–147, 6 pl., 1952.

This paper on infection of *Abies pectinata* in Italy by *Armillaria mellea* and *Fomes annosus* has already been noticed from another source [*R.A.M.*, 29, p. 184].

Murray (J. S.). **A note on the outbreak of 'Chrysomyxa abietis Unger' (Spruce needle rust) in Scotland, 1951.**—*Scot. For.*, 7, 2, pp. 52–54, 3 diags., 1953.

During the autumn of 1951 and the spring of 1952 several reports were received from places in Scotland of the discoloration and death of current-year needles of Norway spruce [*Picea abies*] due to *Chrysomyxa abietis* [*R.A.M.*, 22, p. 231; 28, p. 51; 30, p. 202; 31, p. 147], the needles falling in the early summer of 1952. In one instance *P. rubra* [*? P. rubens*] was attacked. Most of the records were from Argyllshire, but spruce in Newcastleton Forest, Roxburghshire, also suffered severely. The sori were parasitized by *Darluca filum* [cf. ibid., 30, pp. 194, 491]. Meteorological data showed that the temperatures of the spring months of 1951 up to the end of May were considerably and consistently below normal [ibid., 10, p. 141], and it was deduced that flushing in Norway spruce in the areas concerned was delayed by a period of 15 to 21 days. The fact that sporidial production in *C. abietis* is subsequent to flushing and that early flushing trees were unaffected supports the view that needles over a certain age are immune, but in 1951 the bulk of the sporidia were released when most of the needles were in a susceptible condition.

Rusden (P. L.). **Blister rust damage at Waterford, Vermont.**—*J. For.*, 50, 7, pp. 545–551, 1 fig., 3 diags., 1 graph, 1952.

Some of this information on the damage to eastern white pine (*Pinus strobus*) caused by blister rust (*Cronartium ribicola*) [see below, p. 464] at Waterford, Vermont, has already been noticed from another source [*R.A.M.*, 13, p. 282]. Observations over the 20-year period from 1925 to 1945 showed that although trees of all sizes are killed, the process is much slower in the larger ones. It was estimated that by 1945 the basal area of crop pines was reduced by 41·9 per cent.; 98 pines per acre (representing 47·5 per cent. of the crop volume) were killed and that the total potential loss, including the volume in living damaged trees, amounted to 73·2 per cent. As well as the usual control measures [ibid., 27, p. 104; 30, p. 351; 32, p. 156], salvaging infected crop trees before their death is recommended to minimize the loss of timber.

Scheffer (T. C.) & Englerth (G. H.). **Decay resistance of second-growth Douglas Fir.**—*J. For.*, 50, 6, pp. 439–442, 1 fig., 1952.

Studies on the characteristics of coast-type, second-growth Douglas fir [*Pseudotsuga taxifolia*] were begun in 1946 at the United States Forest Products Laboratory. For accelerated decay tests of heartwood samples, 18-in. trunk sections, taken at 6 to 8 ft. above the ground, were cut from 34 trees in the Willamette National Forest, Oregon, in two fully stocked stands, 100 and 150 years old and with a d.b.h. of 15 to 36 and 10 to 27 in., respectively. In laboratory tests which lasted four months two strains of *Poria monticola* [*R.A.M.*, 30, p. 206], and one each of *P. xantha* [ibid., 27, p. 268], *P. incrassata* [ibid., 31, p. 156], *Fomes pinicola* [ibid., 30, p. 593], and *F. roseus* [ibid., 29, p. 3] were used on 1 by 1 by $\frac{3}{8}$ in. blocks, while in the field trials, started in September, 1947, 1 by 1 by $7\frac{1}{2}$ in. stakes were set $6\frac{1}{2}$ in. deep in the ground and left for 26 months. Considerably more decay occurred in the laboratory than in the field. Second-growth Douglas fir was little, if at all, inferior in decay resistance to virgin-growth timber. Resistance was probably not directly influenced by the growing site, the larger differences appearing to be of genetic origin.

Quinquennial programme of research of the Forest Research Institute, Dehra Dun, for 1948–53.—77 pp., [1953. Mimeographed.]

In the section (pp. 18–19) of this publication dealing with the programme of mycological studies at Dehra Dun, U.P., India, it is stated that the work planned includes, *inter alia*, the determination of the rotting abilities of wood-destroying fungi, diseases and decays of conifers, diseases of oak [*R.A.M.*, 31, p. 409] and of hardwoods in the hills and plains, conifer rusts [ibid., 31, p. 410], and tests of the efficacy of various wood preservatives [ibid., 32, p. 411]. *Trametes cubensis* [ibid., 31, p. 95] caused a brown heart-rot of *Eucalyptus citriodora* planted in avenues. The gall-forming rust (*Peridermium cerebrum*) [cf. ibid., 18, p. 73] of *Pinus insularis* was connected with *Cronartium quercuum* on *Quercus griffithi* by aecidiospore inoculation.

The work of the Wood Preservation Branch (pp. 56–60) includes investigations on the osmose and Boucherie processes of timber preservation, on the erratic penetration of various preservatives in chir (*Pinus longifolia*) and other timbers, problems connected with creosote and other oil preservatives, the optimum conditions for preservative treatment of important Indian timbers, the incision method of preservative treatment, cheap and efficient methods of treating hutting and packing-case timbers and bamboos, etc., and the preservation of timber during transit and storage in the log, plank, and sleeper form and of bamboos.

Clymer (C. L.). **Treated fence posts.**—*Circ. Okla. agric. Exp. Sta.* 541, 16 pp., 7 figs., [1952].

This paper on the treatment of fence posts against decay [*R.A.M.*, 32, p. 411] includes a list of various chemicals suitable for the purpose, with directions for their application.

Johnston (A.). **The control by spraying of some diseases of highland vegetables.**—*Malay. agric. J.*, 36, 1, pp. 28–35, 4 pl., 1953.

Plot trials were carried out at the Federal Experiment Station, Tanah Rata, Malaya, in 1951 and 1952 on the control of some vegetable diseases occurring in the highlands, a comparison being made of perenox (0·5 per cent.), Bordeaux mixture (4–5–40), and Shell copper fungicide (0·5 per cent.). All three, applied at 90 gals. per acre 3½ weeks after planting and then at weekly intervals until harvest, were equally effective against potato blight (*Phytophthora infestans*) [*R.A.M.*, 32, p. 119] and though none gave adequate control a reasonable crop, equivalent to 13,365, 12,645, and 10,935 lb. per acre, respectively, was obtained. Increasing the spraying interval with perenox from seven to 10 and 14 days resulted in a crop decrease of 18·7 and 25·8 per cent., respectively. Weekly applications of the above fungicides are, therefore, recommended.

Perenox and Bordeaux mixture (at the rates stated above) reduced leaf blight (*Alternaria dauci*) of carrot (Manchester Table variety) [ibid., 32, p. 303], giving 80 and 81 per cent. non-infected plants, respectively, as against 1 per cent. for the untreated. Used for celery leaf spot (*Septoria apii-graveolentis*) [ibid., 32, p. 359], 4 and 10 per cent. of the plants showed infection as against 96 per cent. of the untreated. The same materials applied five weeks after planting and then weekly until harvest against bean [*Phaseolus vulgaris*] anthracnose (*Colletotrichum lindemuthianum*) [ibid., 32, p. 303] resulted in 2·8 and 0·9 per cent. infected pods, respectively, compared with 24·6 per cent. for the untreated. Weekly applications of 0·25 per cent. perenox (140 gals. per acre) starting eight weeks after planting increased carrot yields from an equivalent of 14,638 lb. per acre (untreated) to 20,366 lb. This treatment is recommended for the control of *A. dauci*. Celery yield was not increased by 0·25 per cent. perenox. Spraying Hawaiian Wonder beans six weeks after planting and then weekly until harvest with 0·25 per cent. perenox, shell copper fungicide (0·25), or Bordeaux mixture (2–2·5–40), all at 220 gals. per acre, resulted in 79·4, 68·6, and 74·8 per cent. healthy pods, respectively, as against 46 per cent. for the untreated. In this experiment bean powdery mildew (*Oidium* sp.) was almost completely suppressed and target spot (*Ascochyta phaseolorum*) [ibid., 27, p. 456] greatly reduced.

Schrödter (H.). **Zur phytopathologischen Problematik von Windschutzanlagen.** [A contribution to the phytopathological problem of windbreaks.]—*NachrBl. dtsch. PflSchDienst, Berl.*, N.F., 6, 5, pp. 91–92, 1952.

Following a brief exposition of the principles involved in the erection of windbreaks as a means of combating plant diseases and pests, the writer reports an experiment at the Aschersleben [Saxony] branch of the Biological Institute in its application to the control of cabbage blackening by *Alternaria circinans* [*A. brassicicola*] and other species [*R.A.M.*, 32, p. 292]. The protection of a crop by a barrier of maize 3 m. wide resulted in an increase in the incidence of blackened pods by an average of 20 per cent. as compared with the number in an exposed stand. The modified microclimate was evidently favourable to the pathogen. [An expanded account of this investigation appears in *Angew. Meteorol.*, 1, 5, pp. 154–158, 2 graphs, 1952.]

HAWORTH (F.). **A note on boron deficiency of Brassicae on St. Coombs.**—*Tea Quart.*, 23, 3, p. 86, 1952.

Typical boron deficiency symptoms in cauliflower, consisting of vertical stem cracking, brown core rot, and the tardy production of small, brown heads [*R.A.M.*, 31, p. 227], and in Brussels sprouts loose sprouts and stem cracking, were observed on St. Coombs, Ceylon, in a garden soil limed to approximately pH 6. The deficiency was remedied by the application of 1 oz. borax to 15 sq. yd.

ALVAREZ GARCÍA (L. A.). **Identity of a chlorotic ring-spot virus from Kale.**—*J. Agric. Univ. P.R.*, 35, 4, pp. 115–125, 1951. [Received March, 1953.]

A mosaic disease of kale (*Brassica oleracea* var. *acephala*) characterized by systemic mottling and chlorotic ring spot on the leaves was observed near Ithaca, New York, in autumn, 1948 [*R.A.M.*, 32, p. 292]. It is of sporadic occurrence and of no economic significance. Pathogenicity trials with leaf extracts revealed that the symptoms were caused by a virus obtained readily from kale and transmitted mechanically to several crucifers but not to non-crucifers. Kohlrabi, cauliflower, Chinese cabbage (*B. pekinensis*), kale, and rutabaga [swede] reacted with conspicuous mosaic symptoms. At about 20° C. kale and swede developed chlorotic ring spot and mottle, while Chinese cabbage usually displayed faint mottle and leaf curling. Brussels sprouts and broccoli were slow to show mottle; cabbage appeared to be the least reactive.

The thermal inactivation point of the virus was about 80°, the dilution tolerance 1:2,000, and longevity *in vitro* approximately 14 days. Work at Cornell University indicated that this and the swede mosaic virus described by Clayton [ibid., 9, p. 572] are related to Tompkins' cauliflower mosaic virus [ibid., 30, p. 297]. The only difference between the kale and cauliflower viruses lies in the temperature range for maximum symptom expression, which is 10° to 19° in the latter: at 20° to 30° the symptoms are masked. The optimum range for swede mosaic was 20° to 27°; this virus did not readily infect cauliflower. Although the trials were too limited to permit the exact classification of the kale virus they were sufficient to demonstrate that it is either identical with or closely related to the cauliflower mosaic virus [see next abstract].

FRY (P. R.). **Cauliflower mosaic : a virus disease of Brassicas.**—*N.Z. J. Agric.*, 85, 6, pp. 507–508, 3 figs., 1952.

In studies at the Plant Diseases Division, Auckland, New Zealand, on cauliflower mosaic virus [cf. *R.A.M.*, 17, p. 6; 32, p. 113, and preceding abstract], which causes sometimes as much as 30 per cent. loss in cauliflowers in some parts of the country, many New Zealand-grown cauliflower, turnip, rape, and swede varieties, including those resistant to club root [*Plasmodiophora brassicae*: ibid., 31, p. 19], were found to be susceptible in the field and in greenhouse inoculation experiments. Of the known aphid vectors [ibid., 28, p. 321] only five occur in New Zealand and only *Brevicoryne brassicae*, *Lipaphis erysimi*, and *Myzus persicae* infest *Brassicae* naturally. The disease was also observed on cabbage in Christchurch, on turnip in Otago, and on swede, rape, and marrowstem kale at Lincoln. To control the disease in the field new crops should be sown well away from existing ones which may serve as a source of infection and the field should be ploughed immediately after harvesting to bury all remaining plants. The same applies to market gardens, where seeds should be sown thinly to avoid a build-up of aphis infestation and infected plants removed at once. Frequent removal of weeds is strongly recommended, particularly in and near districts where the disease is well established, and should be carried out in the month when no *Brassica* crops are grown.

Cheo (P. C.) & Zaumeyer (W. J.). **A new strain of Tobacco ringspot virus isolated from Bean.**—*Plant Dis. Reptr*, 36, 12, pp. 459–465, 1 fig., 1952. [Multilithed.]

A new strain of tobacco ring spot virus [*R.A.M.*, 31, p. 587] was found to be responsible for a severe pod mottle of Bountiful beans (*Phaseolus vulgaris*) in Virginia in 1951. The same strain had been isolated from beans in Delaware several years previously. All the bean varieties tested with the new virus at the Plant Industry Station, Beltsville, Maryland, became infected, most of them displaying more severe necrotic symptoms than those produced by the McKinney strain of tobacco ring spot virus [ibid., 24, p. 136]. The bean strain protected tobacco against infection by the McKinney strain, was inactivated between 65° and 70° C., and at a dilution of about 1 in 10,000, and after 15 days at 18°.

Idaho Refugee, Michigan Dark Red Kidney, and Stringless Green Refugee beans, Jack bean (*Canavalia ensiformis*), hyacinth bean (*Dolichos lablab*), soy-bean, white lupin (*Lupinus albus*), *Nicotiana sylvestris*, *Petunia hybrida*, *Phaseolus lathyroides*, and cowpea var. Victor are all useful hosts in differentiating the several strains of the virus.

Tochinai (Y.) & Sawada (K.). **Studies on varietal susceptibility of Beans to Colletotrichum lindemuthianum Briosi et Cavara. I. Inoculation experiments on seedlings and pods.**—*Ann. phytopath. Soc. Japan*, 16, 3–4, pp. 117–120, 1 fig., 1952. [Japanese, with English summary. Received March, 1953.]

Inoculation experiments were carried out in Japan on pods and seedlings of 44 indigenous and foreign varieties of bean (*Phaseolus vulgaris*) with four strains of *Colletotrichum lindemuthianum* [*R.A.M.*, 31, p. 266; 32, p. 114] isolated from diseased pods of the varieties Kintoki and Concord and from infected Burma seeds. Contrary to the general opinion regarding the resistance of pole beans, Concord and Uzura and the bush varieties Kintoki, Tenashi-naga-uzura, and Chunaga-uzura were susceptible, while the bush varieties Tenashi-chunaga-uzura, Satisfaction, and Beni-kintoki, and the pole varieties Kikuchi-naga-uzura, Tsunetomi-naga-uzura, and O-tebo were resistant. The results of inoculation experiments on pods of six varieties, the resistance of which in the seedling stage had already been graded, demonstrated a correlation between seedling and pod resistance.

Rader (W. E.). **Diseases of stored Carrots in New York State.**—*Bull. Cornell agric. Exp. Sta.* 889, 64 pp., 2 col. pl., 14 figs., 1952. [Received January, 1953.]

Notes are given on the symptoms, economic importance, etiology, and control of the principal diseases of stored carrots in New York State [*R.A.M.*, 28, p. 107].

Plant quarantine announcements.—*F.A.O. Plant Prot. Bull.*, 1, 4, p. 63, 1953.

A decree of 13th October, 1952, from French Morocco prohibits the importation into or transit through the country of cotton plants or any parts thereof (with certain exceptions) on account of *Fusarium* wilt (*F. vasinfectum*), *Phytomonas* [*Xanthomonas*] *malvacearum* [C.M.I. map No. 57], and [cotton] leaf curl virus.

White Pine blister rust quarantine extended.—*J. For.*, 50, 6, p. 509, 1952.

As the result of the detection of white pine blister rust [*Cronartium ribicola*: C.M.I. map No. 6] on white pines, gooseberries, and currants [*Ribes*] in most of the southern Appalachian region, Georgia, Kentucky, South Carolina, and Tennessee have been removed from the list of non-infected States. The amended quarantine regulations, which became effective as from 25th April, [1952], now prohibit the introduction of certified white pine from disease-protected nurseries into non-infected States for reforestation purposes [*R.A.M.*, 30, p. 496].